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TABLE OF CONTENTS

Number I (January 30, 1934)

PAGE

Studies in Stelis. I.
By Oakes Ames 1

Number II (February 6, 1934)

A New Pleurothallis from Honduras.
By Oakes Ames 25

Notes on Philippine Orchids.
By Oakes Ames 31

Number III (February 20, 1934)

Three New Andean Species of Lepanthes.
By L. B. Smith and S. K. Harris 33

Notes on Philippine Orchids. II.
By Oakes Ames 39

Number IV (May 12, 1934)

Three polymorphic Alliances in Epidendrum.
By Oakes Ames, F. Tracy Hubbard and
Charles Schweinfurth 41

Number V (June 12, 1934)

A Contribution to our Knowledge of the Orchids
of Spanish Honduras. Part I.
By Oakes Ames 73

NUMBER VI (June 30, 1934)

PAGE

Studies in Stelis. II.
By OAKES AMES 85

NUMBER VII (June 30, 1934)

A New Liparis from Guatemala.
By OAKES AMES AND CHARLES SCHWEINFURTH . . 97

NUMBER VIII (July 11, 1934)

An Addition to the Genus Vanilla.
By OAKES AMES 101

NUMBER IX (July 31, 1934)

Epidendrum cystosum, a new Species from the Republic of Honduras.
By OAKES AMES 105

A Nomenclatorial Note.
By OAKES AMES 112

NUMBER X (August 10, 1934)

Leo Lesquereux
By WILLIAM C. DARRAH 113

INDEX OF ILLUSTRATIONS

PAGE

Epidendrum cystosum *Ames* 109
Lepanthes pseudocaulescens *L.B.Sm. & Harris* . . 37
Lepanthes polygonoides *L.B.Sm. & Harris* . . . 37
Lepanthes saccosepala *L.B.Sm. & Harris* 37
Liparis fantastica *A. & S.* 99
Pleurothallis oscitans *Ames* 29
Stelis oxypetala *Schltr.* 9
Stelis pendulispica *Ames* 89
Stelis persimilis *Ames* 17
Stelis rubens *Schltr.* 3
Stelis rubens *Schltr.* var. oxypetala (*Schltr.*) *Ames* . 7
Stelis Standleyi *Ames* 21
Stelis Tonduziana *Schltr.* 11
Stelis transversalis *Ames* 93
Stelis Tuerckheimii *Schltr.* 3
Vanilla insignis *Ames* 103

INDEX

TO GENERA AND SPECIES

AMPHIGLOTTIS Salisb.
differmis Britton 54

ARPOPHYLLUM *La Llave & Lex.* 79

AULIZA Salisb.
differmis Small 54

BLETIA *Ruiz & Pav.* . . . 80
alta (L.) Hitchc. 75
Edwardsii *Ames* 83
papillifera *Ames* 83
tuberosa (*L.*) *Ames* . 75,77

Bletilleae 78

BRASSAVOLA *R.Br.* . . 79
cucullata (*L.*) *R.Br.* . . 74
nodosa (*L.*) *Lindl.* . 75,77

BRASSIA *R.Br.* 81
caudata *Lindl.* 74

Bulbophylleae 80

BULBOPHYLLUM *Thou.* 80

CAMARIDIUM *Lindl.* . . 81

CAMPYLOCENTRUM *Benth.* 81
hondurense *Ames* 84

Cataseteae 80

CATASETUM *L.C.Rich. apud Kunth* 80
integerrimum *Hook.* 75,77
maculatum *Kunth* 75
viridiflavum *Hook.* . . . 77

CATTLEYA *Lindl.* . . . 79
Bowringiana *Veitch* . 75,76

CAULARTHRON Raf.
umbellatum Raf. 54

CENTROPETALUM *Lindl.*
costaricense *A. & S.* . . 82

Cephalanthereae . . . 82

Chysieae 80

CHYSIS *Lindl.* 80

COELIA *Lindl.* 80

COMPARETTIA *Poepp. & Endl.* 81

Comparettieae 81

CORALLORRHIZA [*Haller*] *R.Br.* 80

Corallorrhizeae . . . 80

CORYANTHES *Hook.* . . 80
picturata *Reichb.f.* 75,76,77

CORYMBORCHIS *Thou.* . 82
flava (*Sw.*) *O.Ktze.* . . . 82

Cranichideae 78

CRANICHIS *Sw.* 78

CRYBE *Lindl.* 78
CRYPTARRHENA *R.Br.* . 81
CYCNOCHES *Lindl.* . . . 80
Cypripedileae 82
Cyrtopodieae 80
DENDROBIUM *Sw.*
Bullenianum *Reichb.f.* 39,40
erythroxanthum Reichb.f. 39
topazaicum Ames 39
DICHAEA *Lindl.* 81
Dichaeeae 81
ELLEANTHUS *Presl* . . 78
EPIDENDRUM *L. ampl. Neck.* 79
abbreviatum *Schltr.* . . . 74
Amparoanum Schltr. . . 53
arachnoideum Rodr. . 52,54
Arnoldi *Schltr.* 66
atacazoicum Schltr. . 65,68
Barbeyanum *Kränzl.* . . 53
bifalce Schltr. . . . 65,68
biflorum Cogn. . . 42,44,47
Boissierianum Schltr. 42,44,47,48
caloglossum Schltr. . 66,69
capricornu *Kränzl.* . . . 66
chinense (*Lindl.*) *Ames* . 74
chlorocorymbos Schltr. 52,54
comayaguense *Ames* . . 83
corymbosum Ruiz & Pav. 52,54
cystosum *Ames* . . 105,106
densiflorum Hook. . 61,67
difforme *Jacq.* 41,50,51,52,53
var. firmum (*Reichb.f.*) *A.*, *H. & S.* . . . 53,55,57
var. simulacrum (*Ames*) *A.*, *H. & S.* . . . 53,56,57
var. Storkii (*Ames*) *A.*, *H. & S.* . . . 53,56,58
Edwardsii *Ames* 83
Englerianum Lehm. & Kränzl. 64,68
falsiloquum Reichb.f. 64,68
fastigiatum *Lindl.* . . . 67
firmum Reichb.f. . . 52,55
flexicaule Schltr. . 41,43,45
floribundum HBK. 59,60,67
var. *convexum* Lindl. 62,68
var. *lilacinum* Reichb.f. 62,67
frons bovis Kränzl. . 64,68
gratiosum *Reichb.f.* 66,75,76
hondurense *Ames* . . 66,83
imbricatum Lindl. 44,45,47,48
var. *angustifolia* Cogn. 47
ionodesme Schltr. . . 65,68
isthmi Schltr. . 66,69,70,71
laeve Lindl. 61,67
latilabium Reichb.f. . . . 54
latilabre Lindl. 51,52,53,54
laxum *Poepp. & Endl.* . . 60
longicrure Schltr. . . 65,68
macroceras Schltr. . 65,68
majale Schltr. . . . 52,55
mixtum Schltr. . 42,43,45,49
modestiflorum Schltr. 42,43,44,46,47,48
neoporpax *Ames* . . . 112
ornatum Lem. . . . 62,67
paleaceum (*Lindl.*) *Reichb.f.* 77
paniculatum *Ruiz & Pav.* 41,50,58,59,64,66,67
var. *cuspidatum* Lindl. 62,68
var. *longicrure* Lindl. 62,68
paranaense Rodr. 47

parviflorum *Ruiz & Pav.* . 67
patulipetalum *Schltr.* . . 67
physodes *Reichb.f.* 105,106
piliferum Reichb.f. . 63,68
polyanthum *Lindl.*
var. *densiflorum* (Hook.)
Lindl. 62,68
porpax Reichb.f. . . . 112
prostratum (*Lindl.*) *Cogn.*
105,106
pudicum *Ames* 53
radiatum Hoffmgg. . 52,54
ramosum *Jacq.* 41,43,45,50
var. imbricatum (*Lindl.*)
A., H. & S. 43,47,49,50
var. *lanceolatum* Griseb.
42,44,45
var. *lancifolium* Cogn. 45
var. mixtum (*Schltr.*) *A.*,
H. & S. . . . 47,48,49
reflexum A. & S. . . 66,69
resectum Reichb.f.
63,66,68,69
rubrocinctum Lindl. . 61,67
rigidum Lodd. 45
santaclarense Ames
42,44,47,48,49
simulacrum Ames . . 53,57
Stamfordianum *Batem.* . 77
stenopetalum *Hook.* . 75,77
Storkii Ames 53,56
subfloribundum *Schltr.* . . 66
subnutans *A. & S.* . . . 66
subumbellatum Hoffmgg.
51,52,54
syringaeflorum Warsc. apud
Reichb.f. 68
syringiflorum Schltr. . . 68
umbellatum Sw. . . . 51,53
var. *latilabre* Griseb. . 54
umbelliferum J.F.Gmel. 51,53
Turialbae Reichb.f. apud
Schltr. 68
turialvae Reichb.f. . 62,68
vestitum Ames 112
vestitum Sw. 112
virens Hoffmgg. . . 52,54
xipheres *Reichb.f.* . . . 77

EPIPACTIS *Zinn* 82
gigantea *Dougl.* 82
ERYTHRODES *Bl.* . . . 79
vaginata (*Hook.*) *Ames* . . 77
GALEANDRA *Lindl.* . . 80
GALEOTTIA *A.Rich.*
grandiflora *A.Rich.* . . . 82
GONGORA *Ruiz & Pav.* . 80
Gongoreae 80
GOVENIA *Lindl.* 80
HABENARIA *Willd.* . . . 78
Habenarieae 78
HARTWEGIA *Lindl.* . . . 79
HEXADESMIA *Brongn.* . 79
hondurensis *Ames* . . . 83
HEXISEA *Lindl.* 79
Huntleyeae 80
IONOPSIS *HBK.* 81
utricularioides *Lindl.* . . 74
ISOCHILUS *R.Br.* . . . 79
ramosum Spreng. 45
LACAENA *Lindl.* 80
LAELIA *Lindl.* 79
rubescens *Lindl.* . 75,77,78
Wendlandii *Reichb.f.* . . 74
Laelieae 79

LEOCHILUS *Knowles & Westc.* 81

LEPANTHES *Sw.* 79
dasyphylla *Reichb.f.* . . . 36
Edwardsii *Ames* 83
hondurensis *Ames* 83
Nummularia *Reichb.f.* 33,36
peperomioides *Schltr.* . . . 36
pilosella *Reichb.f.* 36
polygonoides *L.B.Sm. & Harris* 34,36
pseudocaulescens *L.B.Sm. & Harris* 33,36
saccosepala *L.B.Sm. & Harris* 35,36

LEPANTHOPSIS *Ames* . . 79

Liparideae 79

LIPARIS *L.C.Rich.* 79
angustiflora *J.J.Sm.* . . . 98
elata *Lindl.* 77
fantastica *A. & S.* 97

LOCKHARTIA *Hook.* . . 81

Lockhartieae 81

LYCASTE *Lindl.* 80

Lycasteae 80

MACRADENIA *R.Br.* . . 81

MALAXIS *Soland. apud Sw.* 79

MASDEVALLIA *Ruiz & Pav.* 79

MAXILLARIA *Ruiz & Pav.* 80
tenuifolia *Lindl.* 74

Maxillarieae 80

MILTONIA *Lindl.* 81

MORMODES *Lindl.* 80

MORMOLYCA Fenzl

MORMOLYCE *Fenzl* . . 81

NOTYLIA *Lindl.* 81

Notylieae 81

OCTOMERIA *R.Br.* 79
hondurensis *Ames* . . . 83

ODONTOGLOSSUM *HBK.* 81

Oncidieae 81

ONCIDIUM *Sw.* 81
excavatum *Lindl.* . . 75,76
hondurense *Ames* 83
pusillum (*L.*) *Reichb.f.* . 77
sphacelatum *Lindl.* . . . 77

ORNITHIDIUM *Salisb.* . . 81
vestitum (*Sw.*) *Reichb.f.* 112

Ornithocephaleae . . 81

ORNITHOCEPHALUS *Hook.* 81

OSMOGLOSSUM *Schltr.* . 81

Pachyphylleae 82

PACHYPHYLLUM *HBK.*
muscoides (*Kränzl.*) *Schltr.* 82

PELEXIA *Poit. apud L.C.Rich.* 78
callosa *Ames* 83
hondurensis *Ames* . . . 83

Phajeae 80

PHYSINGA Lindl.
prostrata Lindl. . 105,106

PHYSOSIPHON *Lindl.* . . 79

Physureae 79

Pleurothallideae . . . 79

PLEUROTHALLIS *R.Br.* 79
hondurensis *Ames* . . . 83
longissima *Lindl.* . 76,77,84
Niederleinii Schltr. . 76,84
oscitans *Ames* 25,83
ruscifolia (*Jacq.*) *R.Br.* . 85
stenostachya *Reichb.f.* . 77

PODOCHILUS *Bl.*
lucescens *Bl.* 31
strictus *Ames* 31

POLYSTACHYA *Hook.* . . 80
clavata *Lindl.* 76

Polystachyeae 80

PONERA *Lindl.* 79

Ponereae 79

PONTHIEVA *R.Br.* . . . 78

PRESCOTTIA *Lindl.* . . . 78

RENANTHERA *Lour.*
elongata *Lindl.* 31
matutina Lindl. 31
micrantha Bl. 31

RESTREPIA *HBK.* . . . 79

Sarcantheae 81

SARCOGLOTTIS *Presl* . . 78
Thelymitra (*Reichb.f.*) *Ames* 76,77,84

SCAPHYGLOTTIS *Poepp. & Endl.* 79

SCELOCHILUS *Klotzsch* . 81

SCHOMBURGKIA *Lindl.* . 79
tibicinis *Batem.* 77

SOBRALIA *Ruiz & Pav.* . 78
Edwardsii *Ames* 83

Sobralieae 78

SPATHIGER Small
ramosus Britton 46

Spirantheae 78

SPIRANTHES *L.C.Rich.* . 78
hondurensis Schltr. 75,76,84
Thelymitra Reichb.f. . . 84

STANHOPEA *Frost apud Hook.* 80

STELIS *Sw.* 79
ciliaris *Lindl.* 87
gracilis *Ames* 5
Liebmannii Reichb.f. apud Hemsl. 1,5,19
mirabilis Schltr. . . 13,23
oxypetala Schltr. . 9,13,23
pendulispica *Ames* . . . 85
persimilis *Ames* . . 14,24
purpurascens *A.Rich. & Gal.* 87
rubens *Schltr.* 5,9,13,14,19,85
var. oxypetala (*Schltr.*) *Ames* 14,23
Standleyi *Ames* . 13,14,23
Tonduziana *Schltr.* . 13,23
transversalis *Ames* . 87,91
Tuerckheimii Schltr. . 5,19

STENORRHYNCHUS
L.C.Rich. 78
orchioides (*Sw.*) *L.C.Rich.* 76,77
speciosus (*Sw.*) *L.C.Rich.* 76,77

Telipogoneae 82

Trichocentreae . . . 82

TRICHOPILIA *Lindl.* . . 81
Trichopilieae 81
TRIGONIDIUM *Lindl.* . . 81
Egertonianum *Batem.* 76,77
TROPIDIA *Lindl.*
polystachya (*Sw.*) *Ames* . 82
Tropidieae 82
VANILLA *Sw.* 78
fragrans (*Salisb.*) *Ames*
76,77,101,102
insignis *Ames* 101
planifolia Andr. 76
Vanilleae 78
WARSCEWICZELLA
Reichb.f. 80
WARSZEWICZELLA
Reichb.f. 80
WULLSCHLAEGELIA
Reichb.f. 78
XYLOBIUM *Lindl.* . . . 80
Zygopetaleae 82

ERRATA

page 24, line 1
for Turialba read Turrialba

page 31, line 8
for 60 read 54

page 31, line 34
for for read from

page 55, line 23
for Centr. Am. read Centr.-Am.

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STUDIES IN STELIS. I.

BY

OAKES AMES

IN PROPOSING a new Stelis of the "Stelis Liebmannii group", it should prove helpful if the allied species of Middle America are compared and clarified. The first species of the group to be recognized was *Stelis Liebmannii*, published as a *nomen nudum* in the Gardeners' Chronicle ser. 2, 12 (1879) 108, and attributed by Hemsley to H. G. Reichenbach. I cannot discover any published description of *Stelis Liebmannii*. The specimen in Reichenbach's herbarium bearing this name is Liebmann's no. 168, collected in August in 1841 near Mirador, Mexico. It is a slender plant, about 14.5 cm. tall, with narrow linear-oblong leaves 6–9 cm. long, with an average width of about 5 mm. The monophyllous secondary stems are very slender, ranging between two and three centimeters in length. The racemes are borne by distinctly flexuous almost filiform peduncles. The diminutive flowers, about twenty in number, on the evidence of dried specimens, appear to have been yellowish, perhaps faintly tinged with purple. The sepals, ovate in outline, are hardly 2 mm. long. The labellum is minute, rather distinctly 3-lobed, with the lateral lobes rounded and erect, and the terminal lobe narrowly triangular-cymbiform, with a sharply upturned acute tip. (The accompanying illustration obviates the necessity of a more detailed description.)

EXPLANATION OF ILLUSTRATION

STELIS RUBENS *Schltr.* Plant natural size, drawn from Liebmann no. 168. 1, flower about 11 times natural size. 2, petal. 3, labellum, as seen from above. 4, labellum, side view. 5, column, anther removed. 6, labellum, drawn from the type of *S. Tuerckheimii* Schltr., side view. 7, flower from the type of *S. rubens* Schltr. 8, petal. 9, labellum, side view. 10, labellum, as seen from above.

The drawings were made from dried specimens, consequently figs. 3 and 10 differ slightly in the thickening of the disc and in outline from the lip of fresh flowers. It is evident that the analytical drawings made by Dr. Schlechter and preserved in his herbarium at Berlin overemphasize the thickening of the disc and give a misleading impression. Furthermore, as Schlechter's descriptions of *S. rubens* and *S. Tuerckheimii* were based on his drawings they are misleading.

Drawn by Blanche Ames

STELIS *rubens Schltr.*

Until 1910, *Stelis Liebmannii* remained the only representative of its alliance in the region north of Panama. In that year Rudolph Schlechter proposed two new species from Guatemala, namely *S. rubens* Schltr. and *S. Tuerckheimii* Schltr. In his notes regarding the affinities of *S. rubens*, Schlechter mentioned *S. gracilis* Ames. It would seem that at this time (the Reichenbachian herbarium was still inaccessible through the terms of Reichenbach's will) Schlechter had not seen anything elucidating *S. Liebmannii*, otherwise he should have cited the Liebmann plant as a close ally of *S. rubens*. It is noteworthy, however, that the comparison of *S. rubens* with *S. gracilis* throws some light on this matter, because while in floral characters these species are not at all similar, they are in their slender habit with filiform rachis and tiny flowers very much alike and through their slenderness quite distinct from the Costa Rican species of the alliance about to be noticed below.

Why Schlechter should have regarded as a new species the plant he described as *Stelis Tuerckheimii* is difficult to understand when it is compared carefully with *S. rubens*. Perhaps he relied on the color of the flowers; but if he did, it should be emphasized that color is a weak character in Stelis, because in identical plants, the color of the sepals may range from greenish yellow to bronzy-purple, influenced, it would seem, by the intensity of the light to which the flowers are exposed. In my studies of Schlechter's types of *S. rubens* and *S. Tuerckheimii* I have been unable to find substantial differentiating characters that keep them apart. I believe they are conspecific and furthermore I am convinced that they are indistinguishable from *S. Liebmannii*. If my conclusions are justified then it would seem that for the plant which has borne the names *S. Liebmannii* Reichb.f., *S. rubens* Schltr. and *S. Tuerckheimii* Schltr. the name *S. rubens*

EXPLANATION OF ILLUSTRATION

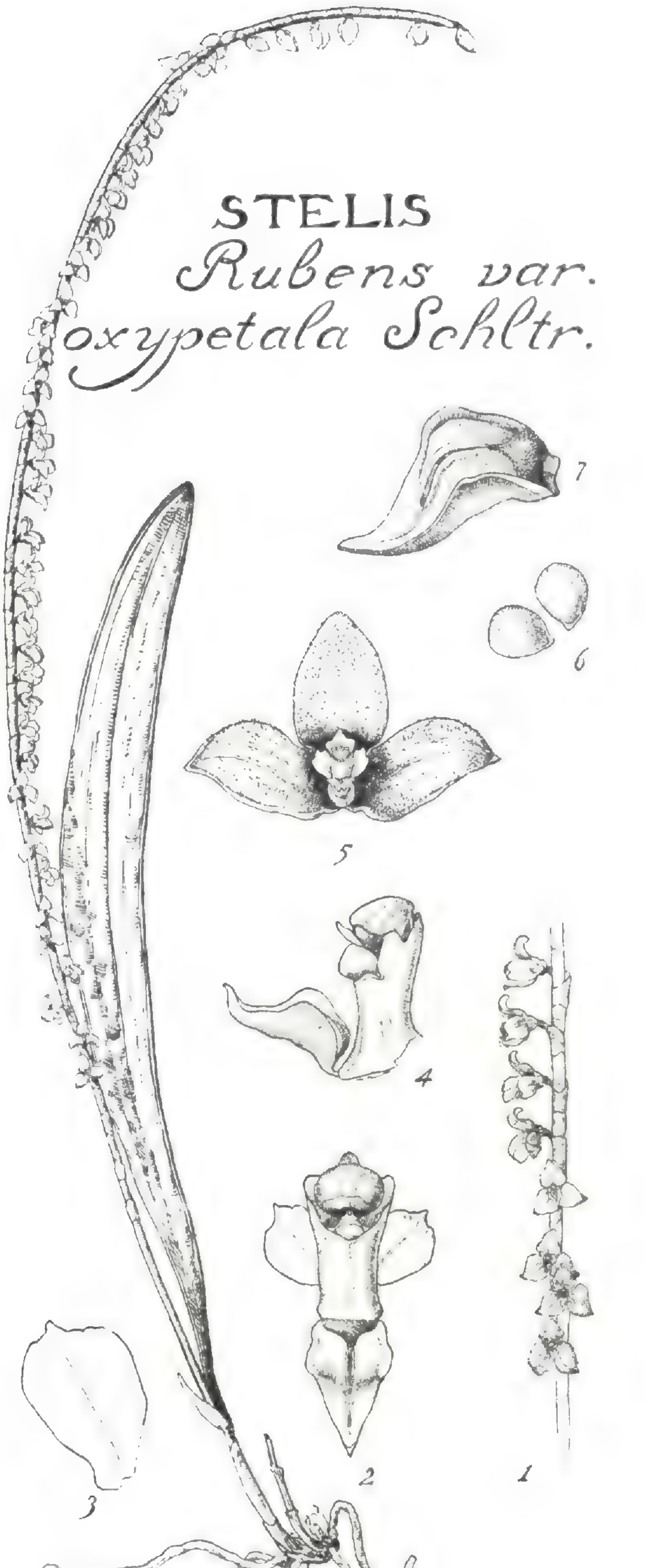
STELIS RUBENS *Schltr.* VAR. OXYPETALA (*Schltr.*) *Ames.*
Plant natural size, drawn from no. 545 of J. B. Edwards' Honduran collections. 1, a portion of the raceme about twice natural size. 2, column with petals and labellum attached. 3, petal. 4, column and labellum, side view showing the protuberant stigma, the obliquely erect rostellum and the anther. 5, flower much enlarged. 6, pollinia. 7, labellum. All drawn with the aid of the camera lucida from specimens preserved in alcohol.

The text cut on page 9 was drawn with the aid of the camera lucida from a flower of Schlechter's type of *S. oxypetala*. 1, labellum, side view. 2, labellum, as seen from above. 3, petal. 4, flower.

NOTE: The raceme of the specimen illustrated exceeds the leaf. It should be noted that racemes may equal or hardly exceed the leaf. With regard to the form of the labellum reference should be made to the note on page 13.

By an oversight the authority as given on the plate is erroneous and should read (Schltr.) Ames.

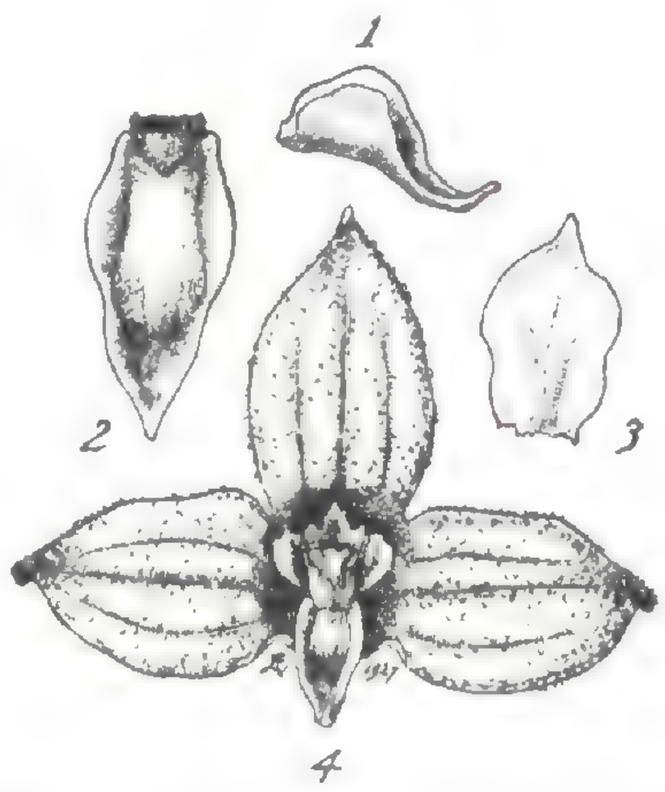
Drawn by Blanche Ames


STELIS
Rubens var.
oxypetala Schltr.
7
6
5
4
3
2
1

should prevail through the rules that establish valid publication. (Cf. illustrations of the flowers from the type specimens.)

In 1918, Schlechter proposed still another species of the *S. rubens* alliance, naming it *S. oxypetala*. This species was also obtained from Guatemala. Aside from inconsequential differences, the only strong character that separates this species from *S. rubens* is the unusual texture and form of the petals. (Cf. illustration in the text of a flower from the type specimen.)

Stelis oxypetala has been a puzzling species chiefly because of its extraordinary rarity. To reduce it to synonomy before exhaustive studies of it could be made, seemed unwise. Recently I received from the Republic of Honduras dried specimens indisputably referable to *S. oxypetala*. These specimens accompanied by flowers preserved in alcohol seemed to constitute evidence showing that *S. oxypetala* might well be a distinct although a weak species. A plate carefully drawn from this material is issued herewith. After the plate was completed, I studied four flowers taken from the dried specimens to compare the perianth organs with the flowers preserved in alcohol. As luck would have it, one of the dried flowers had the characteristic petals of *S. rubens* and made necessary a close examination of every one of the twelve plants constituting Edwards' no. 545. Four of the plants agreed fairly closely with typical *S. rubens*, differing only in having somewhat larger flowers, and petals that proved to be less cuneate in outline and less thickened at the rounded apex. In my opinion *S. oxypetala* is simply a variant of *S. rubens* and should be reduced to varietal rank.

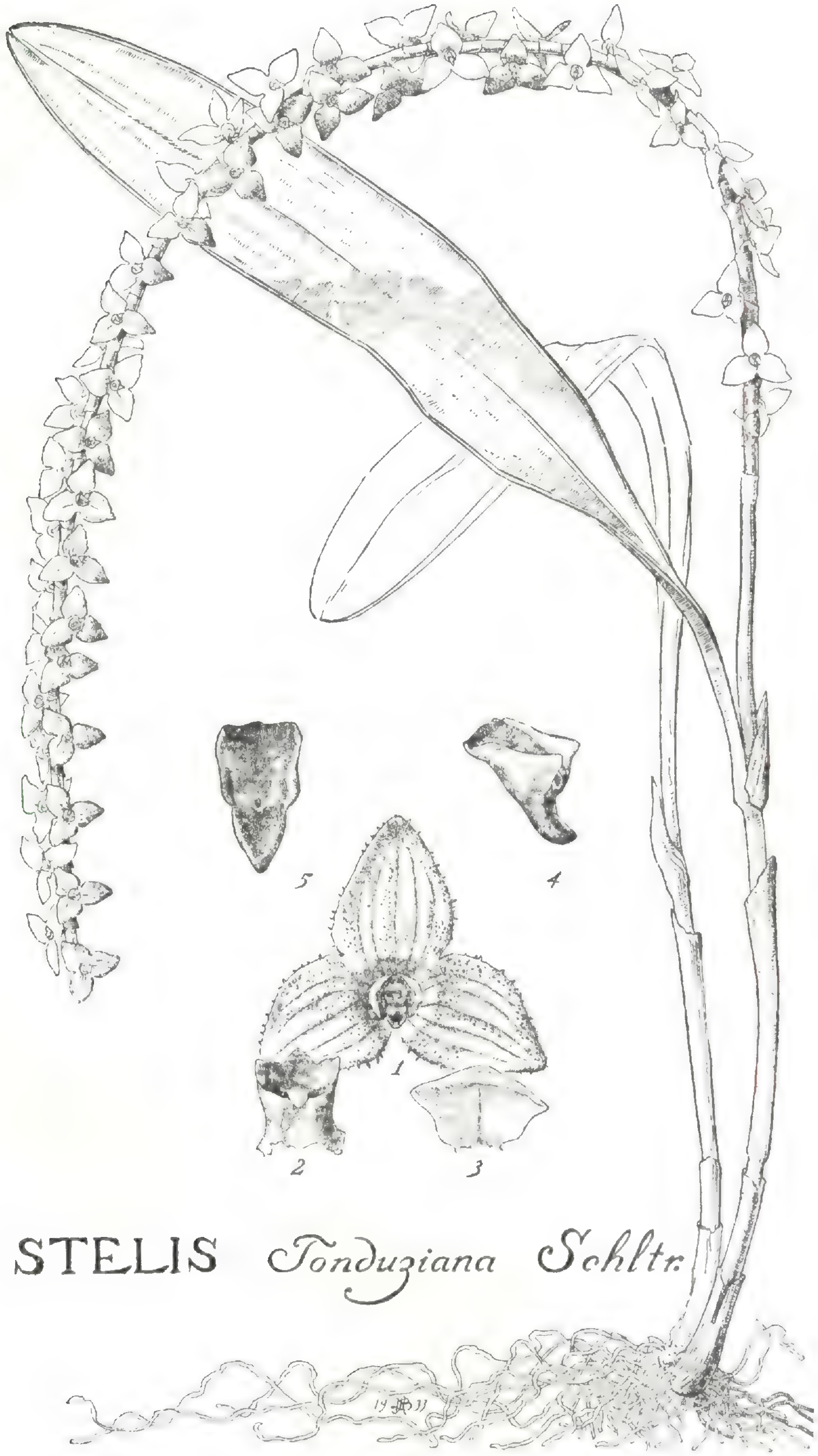


EXPLANATION OF ILLUSTRATION

STELIS TONDUZIANA *Schltr.* Plant natural size. 1, flower much enlarged. 2, column, anther removed. 3, petal. 4, labellum, side view. 5, labellum, as seen from above.

Figures 1–5 drawn with the aid of the camera lucida from the type.

Drawn by Blanche Ames



STELIS *Tonduziana Schltr.*

To one unfamiliar with the variation exhibited by flowers of Stelis and unmindful of the changes that take place in fleshy organs when they are dried for preservation in herbaria, the analytical drawings of the lip of a flower taken from Schlechter's type of *S. oxypetala* may seem to be quite different from the lips of the Honduran plant. With regard to this point it should be borne in mind that dried flowers of the Honduran plants agree almost perfectly with the Guatemalan type. In two flowers taken from the same raceme of Edwards no. 545, one of the lips showed the form exhibited in Schlechter's type of *S. oxypetala*, while the other agreed in every way with the lip represented in the plate of Edwards no. 545.

In Costa Rica there are several species that are closely related to *Stelis rubens* Schltr. They are hardly in the category of geographical varieties. Subtle differences in the structure of the labellum and in the gynostemium serve to distinguish them, although these differences are difficult to describe. The Costa Rican species are stouter and larger-flowered than *S. rubens* and when placed side by side with it are readily separated from it. The first of these Costa Rican species to be described was *Stelis Tonduziana* Schltr. This is the largest flowered species of the group, with the lateral sepals exceeding 4 mm. in length and at least twice larger than the sepals of *S. rubens*. Furthermore, *S. Tonduziana* is characterized very markedly by its 5–nerved sepals. This is the same species as the one described by Schlechter as *S. mirabilis*. In 1924, Paul C. Standley collected several specimens of a remarkable species that I published under the name of *Stelis Standleyi*. The chief difference between this species and *S. Tonduziana* is found in the sepals having three instead of five nerves, although the flowers of the type are considerably smaller, and in this respect easily differentiated.

There is one very remarkable character common to all of these species. I refer to the gynostemium which has the stigmas conspicuously confluent beneath the rostellum and not widely separated on lateral lobes or projections that have their origin as terminal outgrowths. This character is extraordinarily puzzling because it tends to eliminate one of the strongest bits of evidence favoring the separation of Stelis from typical Pleurothallis. Furthermore, in the species of this alliance the stigmas may sometimes protrude forming a globular viscid mass beneath the rostellum, forcing the rostellar process to occupy an obliquely erect position. In the illustration of *Stelis rubens* Schltr. var. *oxypetala* (Schltr.) Ames, this peculiarity is shown in fig. 4.

In 1925, I received several specimens from Costa Rica bearing a strong resemblance to *S. rubens*, but differing from it in the aspect of the labellum, in the stouter vegetative parts and more robust and rigid pedunele. From *Stelis Standleyi* Ames the flowers differ most conspicuously in having the cymbiform apical half of the labellum strongly upcurved. This difference is clearly indicated in the accompanying illustrations. These specimens appear to represent still another species of the *S. rubens* alliance.

Stelis persimilis *Ames, sp. nov.* Herba caespitosa. Caules secundarii erecti vel adscendentes, graciles, monophylli. Folia oblanceolata vel cuneato-spathulata, apice rotundato tridenticulato. Inflorescentiae foliis multo longiores. Racemi dense secundiflori, graciles. Flores atropurpurei. Sepala lateralia elliptico- vel rotundato-ovata, valde glandulosa, trinervia, extus per medium carinata. Sepalum dorsale paulo longius et angustius. Petala rhombica, breviter mucronata. Labellum in circuitu lanceolatum; parte inferiore incrassata cum lobis

erectis rotundatis; parte anteriore concava, apice erecto-uncinata. Columna valde abbreviata, apice trilobulato, rostello late triangulo.

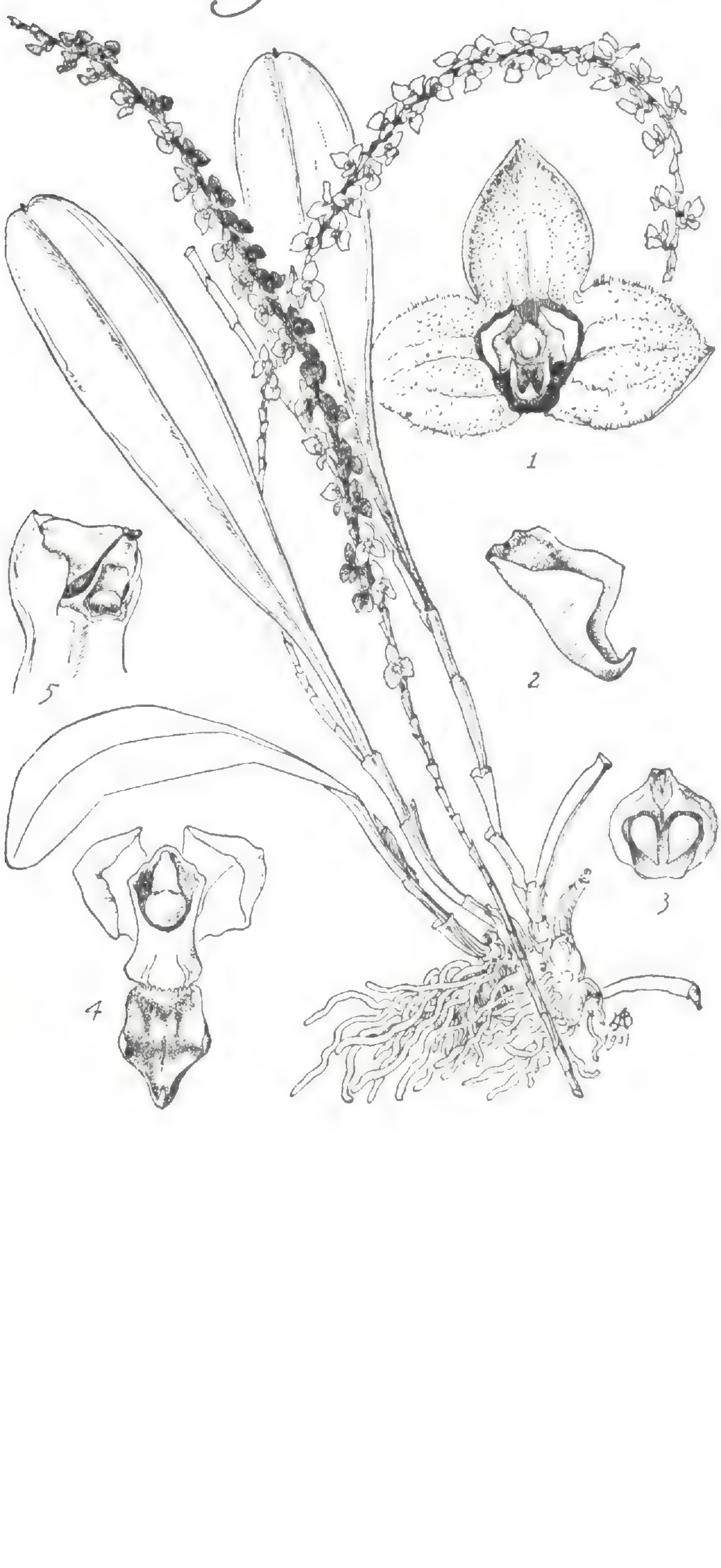
Plant densely caespitose, 8–21 cm. tall including the inflorescence. Roots fibrous, whitish, glabrous. Secondary stems upright or obliquely ascending, monophyllous, up to 7.5 cm. long, entirely or for the most part concealed by tubular imbricating smooth evanescent sheaths. Sheaths up to 33 mm. long. Leaves oblanceolate or cuneate-spatulate, contracted gradually into a slender sulcate petiole; lamina of the leaf 2.6–9.5 cm. long, 10–15.5 mm. wide, distinctly rounded at the tip, the mid-nerve continued into a short apicule; petiole up to 17 mm. long, deeply sulcate. Raceme two to three times longer than the leaf, 8–18 cm. long, about 4 mm. in diameter, erect or slightly arcuate, many-flowered with the flowers maroon, approximate and conspicuously secund. Peduncle below the raceme 1.8 3.8 cm. long, provided with several tubular persistent sheaths. Floral bracts more or less approximate, scarious, infundibuliform, 2.5–3 mm. long. Pedicellate ovary declined, exceeding the bracts. Sepals connate at the base, finely and thickly glandulose on the inner surface, 3-nerved. Lateral sepals round-ovate, obtuse, about 3 mm. long, 2 2.6 mm. wide, with the mid-nerve distinctly carinate on the outer surface and forming an apicule. Dorsal sepal somewhat longer and narrower, ovate, about 3 mm. long, 1.85 2.1 mm. wide, obtuse with a subapical thickening on the dorsal surface. Petals rhombic, sharply angled at the tip, mucronate, 1-nerved, thickened along the upper edge, 1 mm. long, 1 mm. wide. Labellum lanceolate in outline, 1 mm. long; basal half conspicuously thickened with an obliquely erect lobule on each side; apical half triangular, concave, with an upturned more or less acute tip. Column minute, about 1 mm. long, trilobed at the summit with

EXPLANATION OF ILLUSTRATION

STELIS PERSIMILIS *Ames*. Plant drawn natural size. 1, flower. 2, labellum, side view. 3, anther and pollinia from ventral side. 4, column (anther removed) with petals and labellum attached (the labellum sharply deflexed): the semi-globular bulging stigma is shown beneath the triangular rostellum. 5, column with the anther in normal position its apex applied to the rostellum. The semi-globular stigma is shown at the base of the rostellum. Figures 1–5 drawn (much enlarged) with the aid of the camera lucida from the type.

Drawn by Blanche Ames

STELIS *persimilis* *Ames*.



the posterior lobe bluntly triangular and with the lateral lobes erect and minutely paucidentate; rostellum triangular-lingulate, becoming erect after removal of the pollinia, about equalling the posterior lobe; stigmas confluent beneath the rostellum. Pollinia two, pyriform.

Costa Rica, Carpintera and San Isidro. Flowers deep maroon. A fairly abundant species. Leaves coriaceous. September, 1925. *C.H.Lankester 1050.* (Type in Herb. Ames No. 31196.): Irazu, La Canada. Flowers purple. At 7,000 feet altitude. September 10, 1925 (flowering under cultivation October 14, 1925). *C.H.Lankester 1070*: Cedral. *A.Alfaro 199*: Laguna de la Chonta, northeast of Santa Maria de Dota, Provincia de San José. On tree. At 2,000–2,100 meters altitude. December 18, 1925. *Paul C. Standley 42305*: Vicinity of Fraijanes, Provincia de Alajuela. On tree. At 1,500–1,700 meters altitude. February 12–13, 1926. *Standley and Rubén Torres R. 47557.*

The following synopsis will serve to present concisely my conception of the group:

1. Stelis rubens *Schlechter* in Fedde Repert. 8 (1910) 564.

Stelis Liebmannii Reichenbach filius apud Hemsl. in Gard. Chron. ser. 2, 12 (1879) 108, *nomen*; Hemsl. in Godm. & Salv. Biol. Centr. Am. Bot. 3 (1883) 203, *nomen*; Benth. & Hook.f. Gen. Pl. 3 (1883) 490 in note, *nomen*: Schltr. in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 445, *nomen.*

Stelis Tuerckheimii Schltr. in Fedde Repert. 8 (1910) 564.

Mexico, State of Vera Cruz, Mirador. August 1841. *G.Liebmann 168*: Zacuapan. August 1906. *C.A.Purpus 2149.*

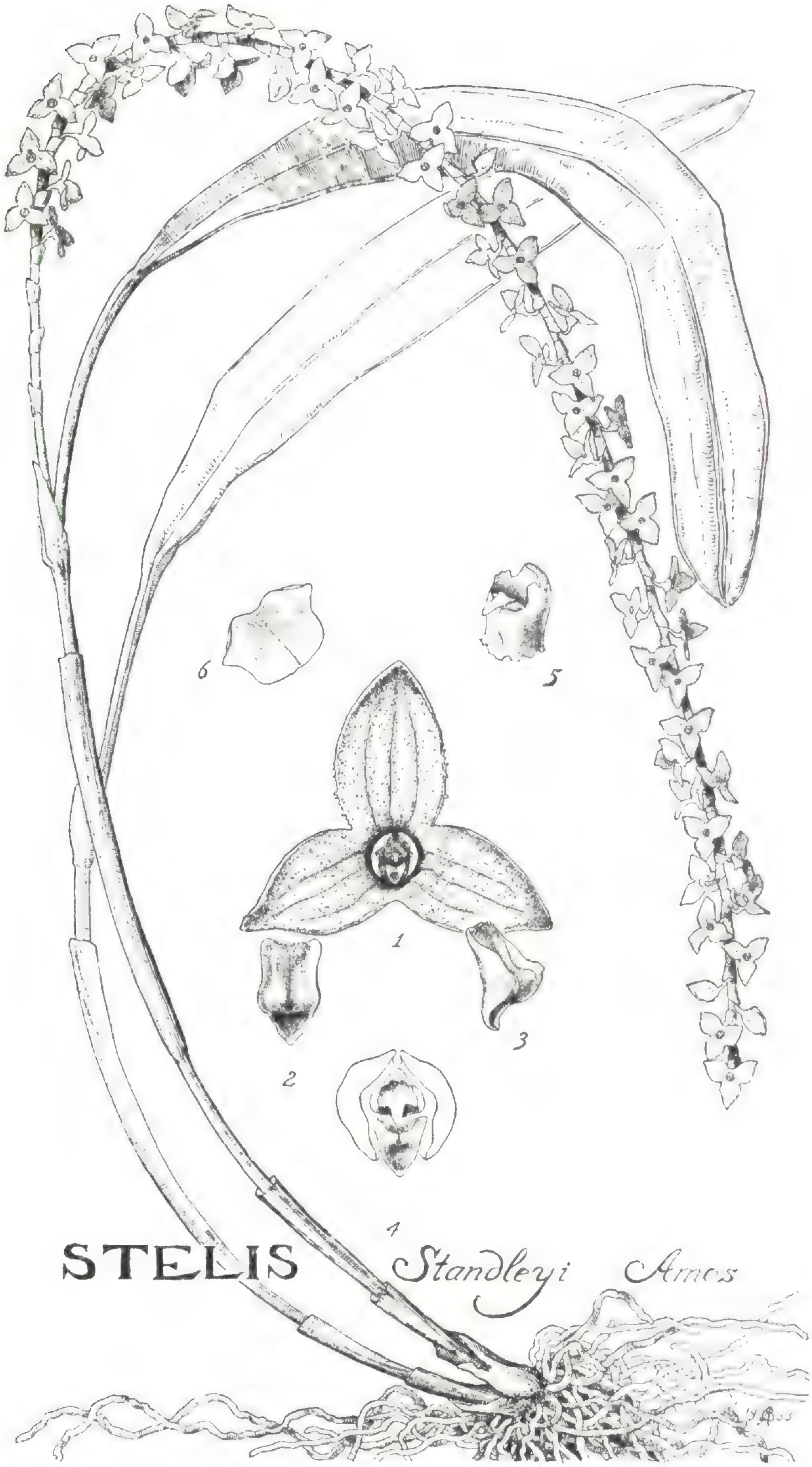
Guatemala, Department of Alta Verapaz, Cubilquitz. At 350 meters altitude. September 1904. *H. von Tuerckheim II. 1061* (Type of *Stelis rubens* Schltr.); At 350 meters altitude. August 1904. *H. von Tuerckheim II.79* (Type of *Stelis Tuerckheimii* Schltr.): Department of Izabal, near Puerto Barrios, about 40 miles from the coast. At 175 feet altitude. September 1930. *Margaret Ward Lewis 5.*

EXPLANATION OF ILLUSTRATION

STELIS STANDLEYI *Ames*. Plant natural size. 1, flower much enlarged. 2, labellum, as seen from above. 3, labellum, side view. 4, column (summit) with petals and labellum attached. 5, column, anther removed. 6, petal.

Figures 1–6 drawn (much enlarged) with the aid of the camera lucida from the type.

Drawn by Blanche Ames



STELIS *Standleyi* Ames

Stelis rubens *Schltr.* var. **oxypetala** (*Schltr.*) *Ames, var. nov.*

Stelis oxypetala Schlechter in Fedde Repert. 15 (Oct. 1918) 203; in Beihefte Bot. Centralbl. 36, Abt. 2 (Nov. 1918) 446.

Guatemala, Department of Petén. In silva primaevae prope Faclus. September 1877. *Bernoulli & Cario 624* (Type of *Stelis oxypetala* Schltr.)

Republic of Honduras, Department of Cortes, Santa Cruz de Yojoa. Epiphyte in open mountain forest at 2,000 feet altitude. Sepals light green with lavender shading. Petals and lip white. September 11, 1933. *J.B.Edwards 545*; From the same locality. Sepals and petals greenish white or white, lip and column white. September 8 and 11, 1933. *J.B.Edwards 543*.

2. Stelis Tonduziana *Schlechter* in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 393; in Fedde Repert. Beihefte 19 (1923) 20.

Stelis mirabilis Schlechter in Fedde Repert. Beihefte 19 (1923) 96.

Costa Rica, La Palma. At 2,500 meters altitude. May 1912. *O.Jimenez s.n.* (Type of *Stelis Tonduziana* Schltr.); *Brade 1203* (Type of *Stelis mirabilis* Schltr.); At 1,180 meters altitude. November 18, 1922. *A.M.Brenes 468*: Cedral, Candelaria Sur. Flowers green and purple. At 1,300 meters altitude. November 27, 1925. *A.Alfaro 7*: La Palma de San José. Flowers obliquely secund, vinous purple. May 15, 1925. *C.H.Lankester 977*: Estrella de Cartago. Flowers maroon. January 1923. *C.H.Lankester 397*; Flowers maroon-purple. At 6,500 feet altitude. July 1925. *C.H.Lankester 1035*; At about 1,600 meters altitude. March 17, 1924. *Paul C. Standley 38074*: Province of San José, La Hondura. At 1,300–1,700 meters altitude. March 2–4, 1924. *Paul C. Standley 36414*.

3. Stelis Standleyi *Ames* in Sched. Orch. 9 (1925) 21.

Costa Rica, Province of Cartago, La Estrella. On tree, flowers dark purple. March 26–27, 1924. *Paul C. Standley 39483, 39386*, and *39419*: Province of San José, La Palma. On mossy tree trunk, flowers dark wine red. At about 1,600 meters altitude. February 3, 1924.

Paul C. Standley 32966: Turialba. Flowers purplish, hyaline. At 350 meters altitude. *A. Alfaro 282*: El Muñeco. At 4,700 feet altitude. June 19, 1928. *H. E. Stork 2723*: La Chonta. May 15, 1928. *Miguel Chacon 1919* (Stork's distribution).

4. Stelis persimilis *Ames*, supra.

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, FEBRUARY 6, 1934 VOL. 2, NO. 2

A NEW PLEUROTHALLIS FROM HONDURAS

BY

OAKES AMES

AN ALTOGETHER remarkable species of the genus Pleurothallis from the Republic of Honduras isdescribed below. It is without close allies in Middle America and in the structure of the rostellum proves to be quite exceptional. In the bud the lamina formed by the coherent lateral sepals closely enfolds the labellum, but at anthesis becomes markedly convex, the lateral margins becoming almost contiguous. The labellum extends parallel to and in close contact with the convex sepaline lamina and is conspicuosly fringed with the segments of the fringe minutely glandulose. The column is characterized by an extraordinary development of the rostellum; this organ is deeply trifid with the elongated lateral segments linear-oblong, more or less porrect near the base and sharply deflexed beyond the middle.

Pleurothallis oscitans *Ames, sp. nov.* Herba verisimiliter caespitosa. Caules secundarii elongati, graciles, monophylli, prope basim paucivaginati, vaginis tubularibus arcte adpressis. Folium coriaceum, oblongo-lanceolatum, acuminatum. Pedunculi fasciculati, ex axilla folii orientes, plus minusve septemflori, verisimiliter penduli. Flores atropurpurei. Sepala lateralia in laminam valde convexam cohaerentia, extus valde carinata, mar-

gine longe ciliata, superne prope marginem longe glanduloso-hirsuta. Sepalum dorsale anguste lanceolatum, apiculatum, acutum, extus per medium carinatum, intus valde pilosum. Petala minuta, lanceolata, uninervia, acuta, margine fimbriata. Labellum anguste lanceolatum, acutum, superne dense papillosum, prope basim breviter bicarinatum, margine dense fimbriato. Columna alata, apice irregulariter dentata, rostello trifido permagno instructa.

Epiphytic herb. Roots coarsely fibrous, whitish, glabrous. Secondary stems monophyllous, 14–19 cm. long, slender, about 2 mm. in diameter when dry, with a closely appressed elongated tubular sheath near the base and with one or more short tubular scarious sheaths near the rhizome, but otherwise the secondary stems are naked and smooth. Leaf terminating the stem, 9–14.5 cm. long, about 2 cm. wide, coriaceous, oblong-lanceolate, acuminate, acute. Peduncles one to three, successive, in the axil of the leaf, issuing from a short spathe-like bract, ascending or strongly arcuate, 5–7 cm. long, each peduncle with a short tubular closely appressed sheath near the base. Raceme 5–6.5 cm. long, about 7 flowered, more or less curved or drooping. Bracts of the raceme tubular at base, acuminate, smooth, exceeding the pedicels. Flowers 10–12 mm. apart. Pedicel and ovary about 5 mm. long, obliquely ascending, smooth. Lateral sepals 12–13 mm. long, coherent throughout their length forming a strongly convex elliptical lamina 8 mm. wide, and conspicuously bicarinate on the outer surface with each carina decurrent on the ovary forming a conspicuous wing; sepaline lamina smooth on the outer surface, conspicuously glandular-hairy near the margin on the inner surface. Dorsal sepal up to 17 mm. long, about 3 mm. wide, narrowly lanceolate, apiculate-acute, carinate along the mid-rib on the outer surface with the carina decurrent on the ovary, glandular within and with long glandular

hairs along the margin. Petals about 3 mm. long, lanceolate, acuminate, 1–nerved, fimbriate on the margin with the segments of the fringe minutely glandulose. Labellum about 7 mm. long, narrowly lanceolate, closely appressed to the lateral sepals,shortly bicarinate at the base, glandulose on the upper surface with the margin fimbriate-dentate, with the slender segments minutely glandulose near their base. Column about 3 mm. long,produced into a short foot, conspicuously winged with the wings deeply lacerate-dentate; rostellum trifid, the lateral divisions porrect-pendent. Pollinia two.

Republic of Honduras, Department of Cortes, Santa Cruz de Yojoa. Epiphyte in open mountain forest at 2,000 feet altitude. Flowers dark purple. August 26, 1933. *J.B.Edwards 515.* (Type in Herb. Ames No. 39597.)

EXPLANATION OF ILLUSTRATION

PLEUROTHALLIS OSCITANS *Ames*. Upper part of plant drawn natural size. 1, side-view of a flower. 2, a fragment of the margin of the labellum showing the glandulose segments. 3, labellum, column and petal viewed laterally. 4, labellum flattened to show the outline. 5, sepaline lamina formed by the union of the lateral sepals. 6, dorsal sepal. 7, column (anther removed to disclose the trifid rostellum) and petals. 8, pollinia united by the glutinous substance of the rostellum. 9, column (anther *in situ*).

Drawn by Blanche Ames, November 1933

PLEUROTHALLIS *oscitans* *Ames*

NOTES ON PHILIPPINE ORCHIDS

BY

OAKES AMES

Renanthera elongata *Lindley*, Gen. & Sp. Orch. Pl. (1833) 218.

Renanthera matutina Lindley in Bot. Reg. 29 (1843) t. 41, non Lindl. Gen. & Sp. Orch. Pl.

Renanthera micrantha Blume, Rumphia 4 (1848) 60.

In Ames Orchidaceae 5 (1915) 224, *Renanthera elongata* Lindl. was cited as a native of the Philippines on the authority of Lindley who referred to specimens collected by Cuming. At that time no material from the Philippines had been seen. In Merrill's Enumeration of Philippine Flowering Plants 1, fasc. 4 (1925) 428, *Renanthera elongata* was excluded from the flora, as after twenty years of intensive exploration no material had been observed.

Recently (December 1933), there has been received from Mrs. K. B. Day fragmentary material of a Renanthera collected on a small island off Mindanao. This material agrees essentially with the plant illustrated in the Botanical Register *loc. cit.*, erroneously referred to the Javan *R. matutina* Lindl., and may be taken as evidence that *Renanthera elongata* Lindl. is a native of the Philippines.

Podochilus lucescens *Blume*, Bijdr. (1825) 295.

In Merrill's Enumeration of Philippine Flowering Plants 1, fasc. 3 (1924) 322, this species was referred to synonomy under *P. strictus* Ames on the understanding that the Philippine material originally referred to *P. lucescens* in Ames Orchidaceae 5 (1915) 90 had been erroneously determined.

Recent studies of this material indicate that it is distinct for *P. strictus* and conspecific with *P. lucescens*.

The following collections have been examined and referred to *P. lucescens.*

Luzon, Tayabas, Bur. Sci. 1255, 20704: Camarines, Bur. Sci. 6371: Camarines Sur, Bur. Sci. 76466.
Samar, Bur. Sci. 17543.
Negros, Bur. Sci. 1137.
Panay, Bur. Sci. 31332, 35346, 35376, 35601.
Leyte, Wenzel 0253, 258a, 420, 0489, 0491, 0536, 0539.
Mindanao, Bur. Sci. 36746.
Tawi Tawi, Bur. Sci. 44255.

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, FEBRUARY 20, 1934 VOL. 2, NO. 3

THREE NEW ANDEAN SPECIES OF LEPANTHES

BY

L. B. SMITH AND S. K. HARRIS

WHILE COMPARING some orchids in the Gray Herbarium the authors noticed three specimens which resembled small vines. On careful study they proved to be three new species of *Lepanthes*, although one of them was originally labelled *L. Nummularia* by mistake. The work of comparing the three species with material or descriptions of all previously known species of *Lepanthes* was greatly facilitated by reference to the herbarium of Professor Oakes Ames, to whom the authors are further indebted for the invitation to publish in this series. The three new species may be characterized as follows:

Lepanthes pseudocaulescens *Smith & Harris, sp. nov.* Herba minuta. Rhizoma repens, cauliforme. Caules perbreves, monophylli, vaginis infundibuliformibus omnino tecti. Folia suborbicularia, 3.5–5 mm. longa, setoso-ciliata. Pedunculus uni-vel bi-florus. Sepala ovata, acuta; lateralia circiter per partem tertiam connata. Petala in lobos elongatissime triangulares transverse extensa. Labellum late lunatum, retusum, auriculis lateralibus reflexis.

Plant minute, doubtless epiphytic, its symmetry strongly dorsi-ventral. Rhizome creeping, stem-like, 5–12 cm. long, filiform, simple or sparingly branched, bearing

infundibuliform sheaths with setose-ciliate mouths. Leaf solitary at the summit of the very short stem, suborbicular, entire, 3.5–5 mm. long, abruptly narrowed at base into the short petiole, 3 nerved, setose-ciliate, apparently fleshy in living material. Pedumcle shorter than the leaf, solitary, 1 to 2 flowered, almost completely concealed by the vaginiform setose bracts. Flowers small, glabrous, dark red in the dried specimens. Lateral sepals ovate, acute, 3 mm. long, 3 nerved, connate for about one-third their length. Dorsal sepal similar but broader. Petals 0.5 mm. long, 4 mm. wide, transversely extended into two equal narrowly triangular acuminate lobes. Labellum broadly lunate, 3 nerved, retuse, its lateral auricles reflexed. Column slenderly cylindric. Anther terminal.

Colombia, forests of the highlands of Popayan, altitude 1700-1800 m., July 1901, *Lehmann no. B. T. 352.* (Type in Gray Herb. Duplicate type in Herb. Ames).

Illustration: 1, plant drawn natural size. 2, section of rhizome with leaves (×5). 3, flower (×10). 4, labellum, as seen from above (×10). 5, column, as seen from the side (×10).

Lepanthes polygonoides *Smith & Harris, sp. nov.* Habitus illum *L. pseudocaulescentis* simulans. Folia elliptica vel ovato-elliptica, 6–11 mm. longa, utrinque glaberrima. Pedunculus uni-vel bi-florus. Sepala elliptica, late acuta; lateralia circiter per duas tertias connata. Petala minuta, rhomboidea, margine minutissime ciliata. Labellum minutissimum, columna omnino obtectum, late ovatum.

Rhizome creeping, stem-like, 25–40 cm. long, simple or sparingly branched, bearing infundibuliform sheaths with setose-ciliate mouths. Leaf solitary at the summit of the very short stem, elliptic or ovate-elliptic, entire, 6–11 mm. long, 5 nerved with all five nerves starting within the sheath and continuing nearly to the apex, en-

tirely glabrous, apparently somewhat fleshy in living material. Peduncle shorter than the leaf, solitary, 1–to 2–flowered, almost completely concealed by the vaginiform bracts. Flowers small. Lateral sepals elliptic, broadly acute, 1.75 mm. long, 1–nerved, connate for about two-thirds their length. Dorsal sepal similar but broader, 3–nerved. Petals minute, 0.25 mm. long, 0.5 mm. wide, rhombic, minutely ciliate. Labellum very small and completely hidden beneath the column, ovate, 2–nerved, 0.4 mm. long. Column short-cylindric and strongly compressed with two erect wings at the summit. Anther terminal.

Ecuador, "Andium Quitensium, crescit in sylvis opacis ad arborum truncos, alt. 7000 pedes, Floret. Septembri, Octobri. 21 Januar 1856," *Jameson 88*. (Type in Gray Herb.)

Illustration: 1, plant drawn natural size. 2, section of rhizome with leaves (×5). 3, flower (×10). 4, column and labellum as seen from below (×10).

Lepanthes saccosepala *Smith & Harris, sp. nov.* Habitus illum *L. pseudocaulescentis* simulans. Folia elliptica, 4–11 mm. longa, utrinque dense setosa. Pedunculus uni- vel bi-florus. Sepala lateralia lanceolata, fere ad apicem connata. Sepalum dorsale orbiculatum, saccatum. Labellum subreniforme, apiculatum.

Rhizome creeping, stem-like, 15-25 cm. long, simple or sparingly branched, bearing infundibuliform sheaths with setose-ciliate mouths. Leaf solitary at the summit of the very short stem, elliptic, entire, 4–11 mm. long, 5–nerved with the outer pair of nerves branching from the inner pair at a point about one-third the distance from the base of the leaf to the apex and rejoining them shortly above the middle, densely setose, apparently somewhat fleshy when fresh. Peduncle much shorter than the leaf, solitary, 1 to 2–flowered. Flowers small, gla-

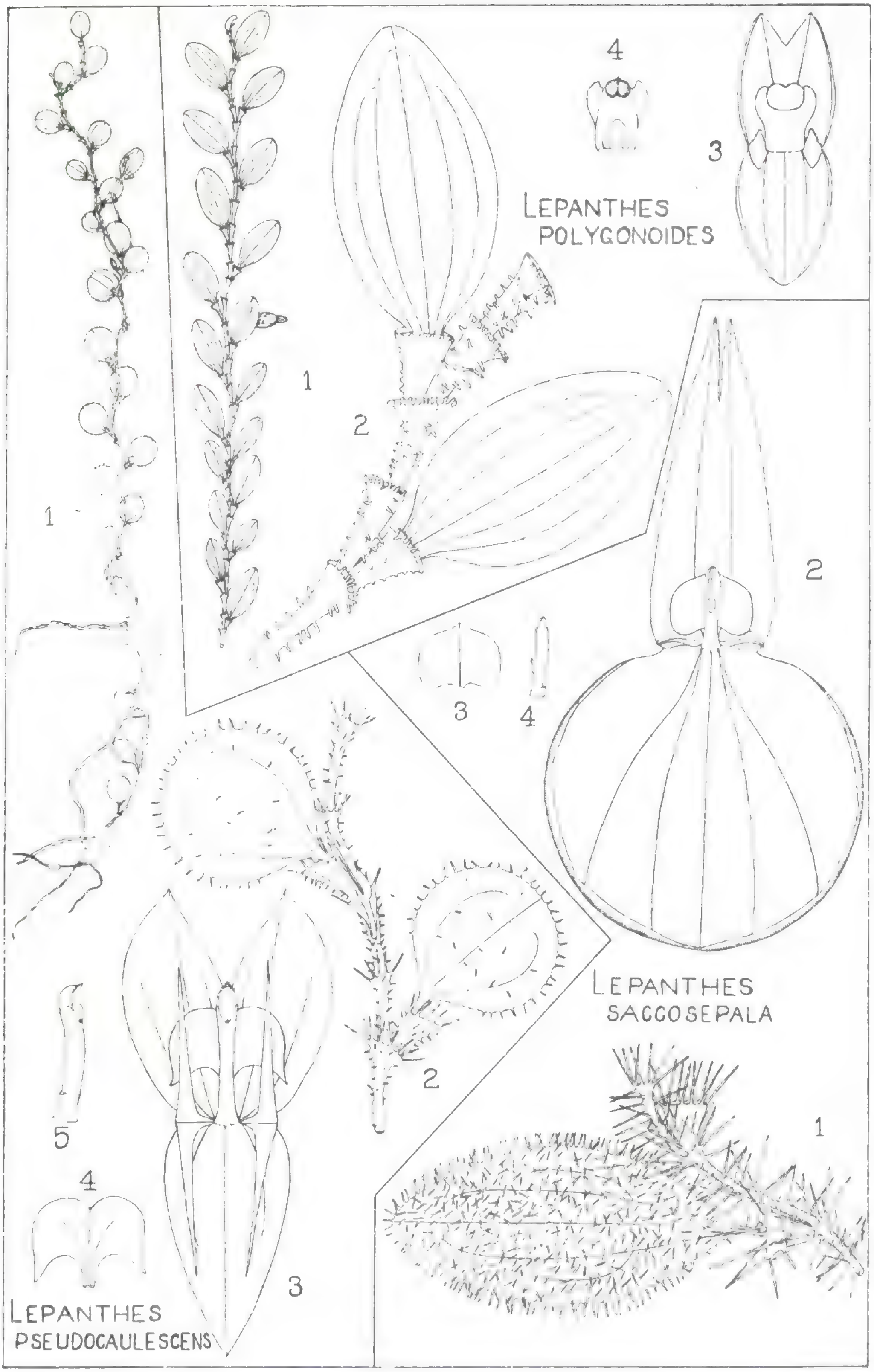
brous, reddish in the dried specimens. Lateral sepals lanceolate, 4 mm. long, 1-nerved, connate almost to apex. Dorsal sepal orbicular with margin inrolled, 4 mm. long, 5-nerved, saccate. Petals ovate-lanceolate, asymmetric, much produced on the side toward the lip, 1 nerved. Labellum subreniform, 1-nerved, apiculate. Column slenderly clavate. Anther terminal.

Ecuador, in moss, forests on west flank of Pichincha, 7000-8000 ft., *Jameson s.n.* (Type in Gray Herb.)

Illustration: 1, section of rhizome with leaf (×5). 2, flower (×10). 3, labellum, as seen from above (×10). 4, column, as seen from the side (×10).

The small number of vine-like species of *Lepanthes* may be keyed as follows:

1. Petals rhombic, broader than long.
   2. Labellum broadly lunate, not hidden by the column. 1. *L. pseudocaulescens*
   2. Labellum ovate, completely hidden by the column. 2. *L. polygonoides*
1. Petals not rhombic, longer than broad.
   3. Labellum neither apiculate nor 3-lobed. 3. *L. pilosella*
   3. Labellum either apiculate or 3-lobed.
      4. Dorsal sepal oblong.
         5. Petals oblong. . . . . 4. *L. Nummularia*
         5. Petals triangular. . . . . 5. *L. dasyphylla*
      4. Dorsal sepal broadly ovate to suborbicular.
         6. Apex of dorsal sepal abruptly acute. 6. *L. peperomioides*
         6. Apex of dorsal sepal broadly obtuse. 7. *L. saccosepala*


LEPANTHES
POLYGONOIDES
LEPANTHES
SACCOSEPALA
LEPANTHES
PSEUDOCAULESCENS

NOTES ON PHILIPPINE ORCHIDS II

BY

OAKES AMES

Dendrobium Bullenianum *Reichenbach filius* in Bot. Zeit. 20 (1862) 214.

Dendrobium erythroxanthum Reichenbach filius in Gard. Chron. ser. 2, 2 (1874) 162.

Dendrobium topaziacum Ames, Orchidaceae 5 (1915) 140.

In 1915 when *Dendrobium topaziacum* was proposed as a new species from the Philippines, I suggested that it might prove to be conspecific with *D. Bullenianum* Reichb.f. At that time, the Reichenbachian Herbarium was inaccessible and it was impossible to interpret *D. Bullenianum* from the original description. Indeed, there was reason to suspect that *D. Bullenianum* was not a native of the Philippines because Reichenbach in referring to it as having come from Manila left room for doubt. In his monograph of Dendrobium, Fritz Kränzlin did not remove this doubt, simply with a query citing Luzon as the source of the type.

From a study of *D. Bullenianum* by means of the analytical drawings preserved in Reichenbach's herbarium, it is clear that *D. topaziacum* is referable to it. It is also clear that *D. erythroxanthum* is conspecific with *D. Bullenianum*.

Dr. Kränzlin in his monograph of the genus Dendrobium in Engler's Pflanzenreich extended the geographical range of *D. Bullenianum* to the Samoan Islands on the evidence of specimens collected on Upolu by Reinecke (nos. 294 and 392). This is a rather remarkable extension of range. It is not at all improbable that the Samoan species will in the light of further research, be found distinct from the Philippine species.

Dendrobium Bulleianum is by no means a common orchid. With the exception of a cultivated specimen, lacking definite data, and the specimens in Reichenbach's herbarium I have only seen the following collections of Philippine origin.

Luzon, Camarines Sur, Kolago River, on tree trunk in forest at 1500 feet altitude. Flowers pinkish yellow. November 11, 1928. *G. Edaño* Bur. Sci. 75840: Isabela Province, Mount Cresta, in forest stream at low altitude. Flowers yellow. April 3, 1929. *M. Ramos* Bur. Sci. 77160.

Leyte, Dagami. Epiphyte at 60 meters altitude. Flowers red and yellow. July 17, 1913. *C. A. Wenzel 0202.* (Type of *D. topaziacum* Ames).

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, MAY 12, 1934 VOL. 2, NO. 4

THREE POLYMORPHIC ALLIANCES IN EPIDENDRUM

BY

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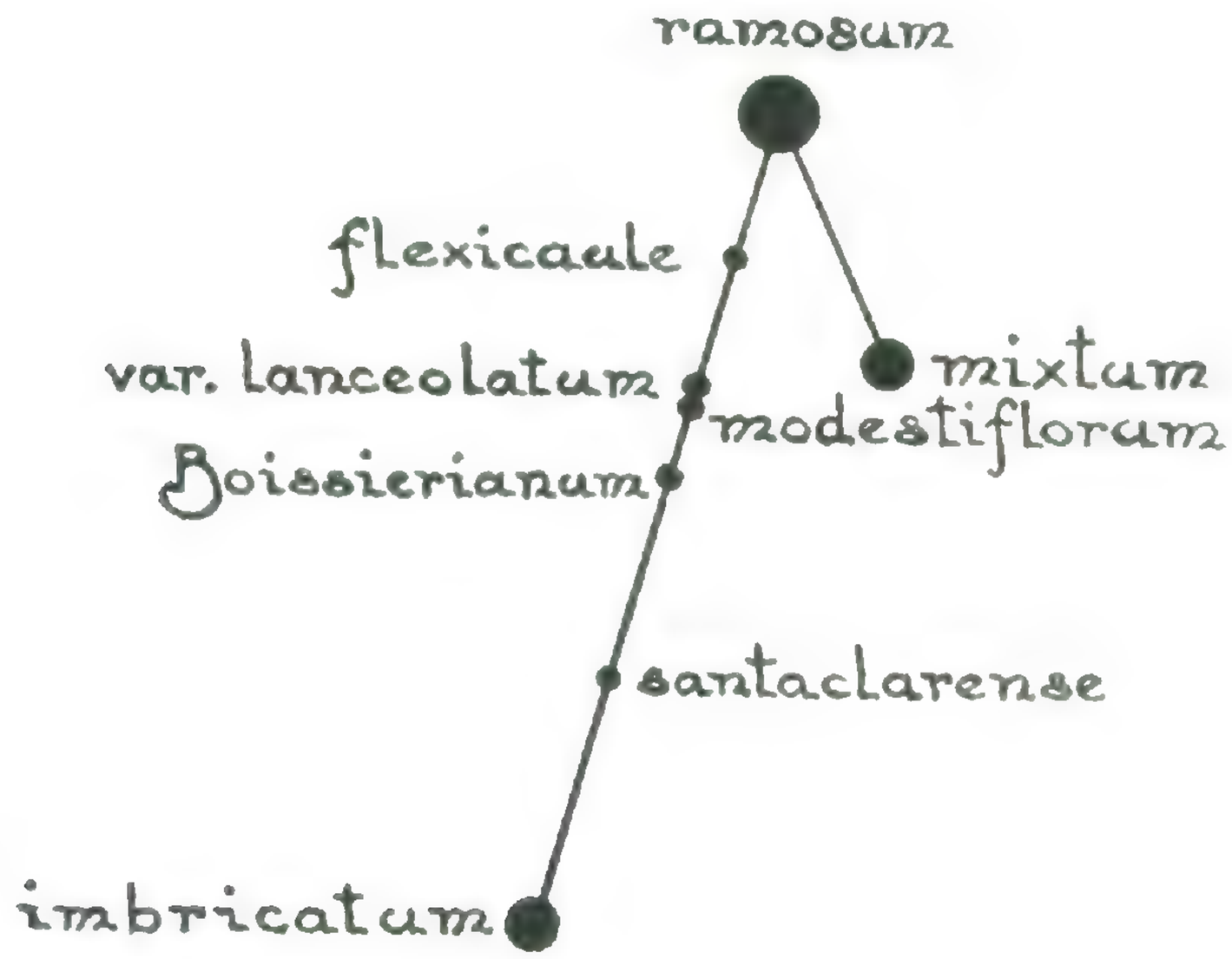
IN PREPARING a key to the Continental North American species of Epidendrum, several alliances showing wide variations in form and character have been variously interpreted as species and as synonyms. Among these alliances are *Epidendrum ramosum* Jacq., *E. difforme* Jacq. and *E. paniculatum* Ruiz & Pav.

EPIDENDRUM RAMOSUM ALLIANCE

Given a limited number of specimens representing the extremes of the different variants, one would at once determine them as species, but a careful study of a large amount of material has led us to believe that all the variations are referable to one polymorphic species comprising a typical form and two groups which vary consistently enough to be recognized as varieties.

The typical form of *Epidendrum ramosum* as described by Jacquin and as illustrated by him (a fragment of the end of a branch only) is a rather strict plant with laxly 4-to 5-flowered racemes and ligulate leaves which are 2–5 cm. long and 4–8 mm. wide. This represents one of the smaller-flowered forms of the alliance. Transitions from this through the more slender, more flexuous, fewer-flowered form described as *E. flexicaule* Schltr. to the

more dwarf, usually 2-flowered variant called *E. ramosum* var. *lanceolatum* Griseb. (which is scarcely separable from Schlechter's *E. modestiflorum*) can be readily traced. The *E. modestiflorum* form grades into the variant named *E. Boissierianum* Schltr. (*E. biflorum* Cogn., nec Forst. f., nec Ruiz & Pav., nec Rodr.) and through it to *E. santaclarense* Ames and to the extreme form represented by *E. imbricatum* Lindl. (cf. diagram); this form being characterized by its stout stems, large leaves, dense head-like racemes of relatively large flowers and very conspicuous conduplicate bracts.



Another line of transition leads through varying vegetative characters and variation in the callus of the lip to the form described as *E. miatum* Schltr. The type of *E. miatum* is a tall very stout plant with large branches and two forms of leaves; that is, the leaves of the primary stem are much larger and longer than those of the secondary stems.

The extreme phase of any one of these named forms is very distinct, but the presence of gradients from one phase to another convinces us that the extremes should be

regarded as the terminating phases of one strain of a polymorphic species.

In general it may be said that no sharp line of demarcation can be found in either the floral or vegetative characters exhibited by *Epidendrum ramosum*. The size of the flower, the texture of the flower, and the form of the floral segments vary in any one of the forms. The inflorescence in any proposed concept varies in density, in the number of flowers, and in spread. The bracts of the inflorescence range widely in size, in the degree of conduplication or convolution, in being strongly carinate to perfectly rounded and ecarinate on the outer surface, in the presence or lack of maculation and in several other characters that might be mentioned. The vegetative characters are quite as variable. They range from a small rather strict form to a lax, weak and much branched form, as well as to a stouter, more or less branched variant (*E. modestiflorum*). In the var. *imbricatum*, there is also decided variation in the height and branching of the plant, but the stems are consistently robust. In var. *mixtum*, the habit is extremely variable, ranging from the very stout, tall, heavily branched type of *E. mixtum* to specimens from Guatemala collected by Johnson (no. 552) and from Honduras collected by J. B. Edwards (nos. 67, 71 and 245). The specimens are habitally similar to the typical form of *E. ramosum*. Even the characters of the column and of the callus are variable and show intergradation between recognized forms.

A short discussion of the salient characters of the several forms described as species should be helpful.

E. flexicaule Schltr. of which the type was collected by C. Wercklé at La Palma in Costa Rica differs from the typical West Indian form of *E. ramosum* in having rather weaker stems that appear to be normally less branched.

E. ramosum var. *lanceolatum* Griseb. has broader leaves and larger bracts and flowers. As interpreted by Cogniaux, the variety *lanceolatum* seems to have 2-flowered inflorescences. In our judgment, this is the West Indian representative of Schlechter's *E. modestiflorum*.

E. modestiflorum Schltr. of which the type was collected by A. M. Brenes no. 128 in August 1921 at San Pedro de San Ramon, Costa Rica, differs in its stiffer and stouter habit, usually 2-flowered inflorescence and broader thicker leaves. Its habit is also more dwarf and often less branched.

E. Boissierianum Schltr. (a new name for *E. biflorum* Cogn., which is a homonym) is a plant much like *E. modestiflorum* in habit, but approaches *E. imbricatum* Lindl. in some of its characteristics. The type was collected in Costa Rica by Ad. Tonduz.

E. santaclarense Ames, of which the type is C. H. Lankester & A. Sancho no. 443, collected at Santa Clara south of Cartago, Costa Rica, is a robust branched plant with lax inflorescences, with the flowers somewhat similar to those of *E. modestiflorum* and with the bracts of the inflorescence also suggesting those of *E. modestiflorum*, but more elongated. It seems strictly intermediate between the two forms *E. modestiflorum* and *E. imbricatum*.

E. imbricatum Lindl. of which the type was collected by Prescott in Brazil and which is also represented by Gardner no. 630 from the Organ Mts., Brazil, typically has a head-like inflorescence "two inches long, by one and a half inch broad." (fide Lindley, Fol. Orch. Epid. p. 78). The bracts of the inflorescence are carinate, conduplicate and large in the extreme form (cf. diagram on p. 42), but vary toward those of the *E. modestiflorum* form. The inflorescence also is often less head-like, more open and fewer-flowered than in the plants described by

Lindley.

E. mixtum Schltr.,–of which the type collection is H. von Tuerckheim no. II 1868, December 1908, near Coban, Guatemala,–is a stout, tall plant with elongated branches subtended by large lorate leaves (up to 25 cm. long and 2 cm. broad). The leaves of the primary stems are much larger than those of the branches. The flowers are much larger than those of the typical form and are borne in drooping racemes. The bracts of the inflorescence are about intermediate in size between those of Jacquin's type and the form called *E. imbricatum*. The principal point of distinction, however, is the callus of the lip which is tridentate or trilobulate at its apex. This character seems to us to be more diagnostic than the very variable vegetative differences, and even this character is approached in some specimens of the typical form and of the *E. imbricatum* variant.

In spite of intergradation, however, we feel that there are three rather clearly marked forms based upon fairly consistent trends of grouped characters and we are convinced that these trends of grouped characters indicate an alliance composed of a species and two varieties, as follows:

Epidendrum ramosum *Jacquin*, Enum. Pl. Carib. (1760) 29 and Select. Stirp. Am. (1763) 221, t. 132.

Isochilus ramosum Sprengel, Syst. Veg. 3 (1826) 734.
Epidendrum rigidum Loddiges, Bot. Cab. 16 (1829) t. 1600, non Jacq.
Epidendrum ramosum Jacq. var. *lanceolatum* Grisebach, Fl. Brit. W. Ind. (1864) 618.
Epidendrum ramosum Jacq. var. *lancifolium* Cogniaux in Martius, Fl. Bras. 3, pt. 5 (1898) 173, *sphalm.*
Epidendrum flexicaule Schlechter in Beihefte Bot.

Centralbl. 36, Abt. 2 (1918) 403.
Epidendrum modestiflorum Schlechter in Fedde Repert. Beihefte 19 (1923) 213.
Spathiger ramosus Britton in Sci. Surv. Porto Rico and the Virgin Islands (Britton & P. Wilson, Bot. Porto Rico and the Virgin Islands) 5, pt. 2 (1924) 202.

Plant very variable in habit, upright, pendulous or apparently creeping, simple to much branched. Stems slender and often flexuous to stiff and rather stout (up to 4 mm. in diameter just below the inflorescences) 12 cm. up to 90 cm. tall or long, the main stem often somewhat woody, concealed by the persistent leaf-sheaths, often rooting above when creeping or decumbent. Branches variable in length and number, subtended by a leaf which is apt to be larger in dimensions than those of the branches or by a leaf-sheath, spreading or decumbent to upright. Leaves more or less coriaceous, very varied in shape, ligulate to linear-ligulate, lanceolate to oblong-elliptic and all intermediate forms, .9 12 cm. long, 2 14 mm. wide (usually less than 10 mm. wide), apex unequally bilobed. Inflorescence terminal at the end of the stem or branches, 2-flowered (*E. modestiflorum*) to several-flowered (if several-flowered usually lax and noticeably decumbent); rachis when elongate often somewhat flexiflex, usually slender. Bracts of the inflorescence variable in size and texture, more or less conspicuous, more or less carinate when small, rounded and ecarinate on their back when large (*E. modestiflorum*), subacute to rather rounded-obtuse, 5 mm. up to 1.7 cm. long, up to 1.2 cm. broad when spread, not maculate. Flowers variable in size and texture, usually somewhat coriaceous. Lateral and dorsal sepals similar, the laterals slightly broader, 4.5 13 mm. long, 1.5 3 mm. wide, lanceolate to elliptic-oblong, more or less carinate at the apex on the exterior surface (laterals

slightly more so) and sometimes dentately so in the *E. modestiflorum* form, subacute to acute. Petals 4.5–13 mm. long, .8–2.3 mm. wide, linear to linear-spatulate, acutish to rounded-obtuse. Labellum adnate to the column the entire length of the column; lamina simple to occasionally subtrilobulate, ovate to triangular-ovate, lanceolate-ovate or ovate-lanceolate, 4–9 mm. long, 2–5 mm. wide, rounded or obtuse to subacute, acute or acuminate at the apex, cordate or subcordate at base; callus somewhat variable in the distance that it extends down the lamina, its base usually distinctly bifurcate, its apex occasionally tending to be trilobulate and thus approaching var. *mirtum*. Column stout, extending slightly beyond the cordate base of the lamina of the labellum, its apex truncate to dorsally excavated, with or without two divergent dorsal terminal teeth (these more apt to be present in the *E. modestiflorum* form and also in var. *imbricatum*).

Epidendrum ramosum *Jacq.* var. **imbricatum** (*Lindl.*) *Ames, Hubbard & Schweinfurth, comb. nov.*

Epidendrum imbricatum Lindley, Gen. & Sp. Orch. (1831) 110, non Lam.
Epidendrum paranaense Rodrigues, Gen. et Sp. Orch. Nov. 2 (1882) 139 (fide Cogn.).
Epidendrum imbricatum Lindl. var. *angustifolia* Cogniaux in Martius, Fl. Bras. 3, pt. 5 (1898) 171.
Epidendrum biflorum Cogniaux in Bull. Herb. Boiss. ser. 2. 2 (1902) 337, text cut, nec Forst.f., nec Ruiz & Pav., nec Rodr.
Epidendrum Boissierianum Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 459.
Epidendrum santaclarense Ames in Sched. Orch. 4 (1923) 49

Plant usually stout and branched, though occasion-

ally not much stouter than the *E. modestiflorum* variant of the typical form or only slightly branched (*E. Boissierianum*), up to 2 m. tall (fide Cogniaux in Mart. Fl. Bras. 3, pt. 5 (1898) 170). Stems erect or possibly more or less recumbent (rooted when recumbent), stout, commonly 5–6 mm. in diameter just below the inflorescence. Leaf-sheaths finely maculate in the extreme development. Leaves rather coriaceous, ligulate to oblong-lanceolate or rarely elliptic, 2.5–14.5 cm. long, 8–25 mm. broad (the main leaves commonly 15 mm. or more broad), apex entire or unequally bilobed. Inflorescence terminal, variable from 1- to 2-flowered (*E. Boissierianum*) to several-flowered. When it is several-flowered it is open (*E. santaclarense*) to head-like (*E. imbricatum*). Bracts of the inflorescence (or spathes in *E. Boissierianum*) apt to be finely maculate (always so in the *E. santaclarense* and *E. imbricatum* forms), 1.5–3 cm. long, usually imbricated (well separated in the *E. santaclarense* form which was described from mature plants), apex rounded to subacute, often apiculate, rather strongly conduplicate and carinate or (in the *E. santaclarense* form) rounded and ecarinate on the back, elliptic-oval to broad-ovate when spread out. Flowers rather coriaceous, approximate to 7–10 mm. apart in the *E. santaclarense* form. Pedicel and ovary up to 3 cm. long (*E. santaclarense* form). Lateral sepals variable in shape, lanceolate, oblong-lanceolate or ovate-lanceolate, somewhat oblique, 9–15 mm. long, 3–5 mm. wide, acute to acuminate, slightly carinate on the dorsal surface toward the apex. Dorsal sepal lanceolate, oblong-lanceolate or elliptic-lanceolate, 9–15 mm. long, 3–5.5 mm. wide, obtuse (rarely) to acute, slightly carinate on the dorsal surface near the apex. Petals very variable in shape, from linear to spatulate-elliptic, but commonly tending toward narrowly elliptic-lanceolate, 8.5–14.5 mm. long, 1.8–5.6 mm. wide, apex varying from obtuse

to acute. Lamina of labellum ovate, triangular-ovate (*E. santaclarense* form) to rarely broadly ovate, obtuse to acute. Disc normally with a callus similar to that of the typical form, but rarely with the apex somewhat trilobulate as in var. *mixtum* (specimen from Cocos Island). Column much as in the typical form, dorsal teeth usually lacking, if present they are small.

Var. *imbricatum* intergrades strongly with the typical form of the species and separation is at times difficult. Characters which make for its separation when grouped or even alone,–if they are extreme,–are the thicker stems, the presence of fine maculation on the leaf-sheaths and bracts, the more imbricated and conduplicate bracts (which are also apt to be more conspicuous), the tendency toward broader and larger leaves and the rather dense head-like inflorescences in the more extreme form.

Epidendrum ramosum *Jacq.* var. **mixtum** (*Schltr.*) *Ames, Hubbard & Schweinfurth, comb. nov.*

Epidendrum miatum Schlechter in Fedde Repert. 10 (1912) 294.

Plant very variable, erect, 15–100 cm. tall, nearly simple to heavily branched. Stems rather slender to very stout, sometimes flexuous. Leaves ligulate, variable in size from 2 cm. long and 4 mm. wide (in the simpler slender form) up to 24 cm. long and about 20 mm. wide (large leaves of the main stems in the branched stouter form). Inflorescence terminal on the branch or stem, usually drooping, racemose, several-flowered. Bracts of the inflorescence 6–16 mm. long, somewhat conduplicate and carinate on the outer surface, acute, elliptic to elliptic-ovate. Flowers similar to the typical form of the species. Lateral sepals lanceolate, somewhat asymmetrical, 10–16 mm. long, 2.5–3.5 mm. wide, acuminate, strongly carinate at the apex on the exterior surface and usually dentately

so. Dorsal sepal lanceolate, 9–15 mm. long, 2–3.5 mm. wide, acuminate, more or less carinate at the apex. Petals linear-ligulate, linear-lanceolate or narrowly lanceolate, 7.8–14.2 mm. long, 1–1.8 mm. wide, acute or more commonly acuminate. Lamina of the labellum narrowly triangular or more rarely ovate-triangular, 7–12.5 mm. long, 4–8 mm. wide, acute or usually long acuminate. Disc with a callus which is tridentate or trilobulate at its apex. Column not distinctive, much as in the typical form of the species.

Var. *miatum* is separable from the typical form in having the apex of the callus tridentate or trilobulate and by the more acuminate apices of the floral segments, especially of the labellum. In the extreme form the very long leaves of the main stems is also diagnostic. It differs from var. *imbricatum* in the acuminate apices of the perianth segments and in usually drooping inflorescences. A tendency toward the tridentate or trilobulate apex of the callus is sometimes existent in var. *imbricatum*, especially so in the specimen from Cocos Island.

Epidendrum difforme alliance

The constituents of this alliance seem, as a whole, to be more consistent in vegetative characters than in those of the *Epidendrum ramosum* and *E. paniculatum* alliances, but the floral characters are variable, especially with regard to the labellum. The variations of the labellum are sufficiently distinct to differentiate three varieties, but intergrade too much to warrant maintaining them as species.

The typical form, as described from a Martinique specimen and as inadequately illustrated by Jacquin, is a comparatively small plant up to 30 cm. tall (16 cm. in Jacquin's illustration), caespitose with elliptic-oval leaves up to 6 cm. long and nearly 3 cm. wide. The inflorescence

is umbellate, about 5-flowered, the flowers are shown as small and the labellum would appear to be rather simple. Variations from the Jacquin type are numerous, especially with regard to the size of the plant, the size of the leaf, the number of the flowers in the umbel (rarely 1-flowered) and very noticeably in the size and contour of the lip.

The following synopsis sets fourth briefly the characters of the concepts that have formerly been considered separate species:

Epidendrum umbellatum Sw. is without sufficient description to differentiate it from the Jacquin type. Moreover, Swartz cites the Jacquin plate. Swartz's type came from Jamaica. Lindley accepted the name *E. umbellatum* in place of *E. difforme*, considering them one species.

Epidendrum latilabre Lindl. was described from a Brazilian plant in Herb. Hooker and from a living specimen sent him from the collection of Messrs. Loddiges. Its chief character is the lip which Lindley in his original description states is "four times broader than long, and curved downwards on each side, so as to bear no little resemblance to a stiffly starched lady's apron,". In Folia Orchidacea Epidendrum p. 80, Lindley remarks, "Nevertheless, it is much to be doubted whether this is anything more than a gigantic variety of *E. umbellatum.*" The drawing in the Lindley Herbarium of the Brazilian specimen which is in the Hooker Herbarium tends to confirm Lindley's statement.

Epidendrum subumbellatum Hoffmgg., the type of which is from Rio de Janeiro, Brazil, appears, from the description, to be a form with two to three flowers. The lip is 4-lobed with the lobes about equal.

Epidendrum umbelliferum J. F. Gmel. is so inadequately described that it is difficult to interpret its characteristics, but the reference "*Jacq. stirp. amer. t. 136?*" places it in the same alliance with *E. difforme*.

Epidendrum radiatum Hoffmgg., non Lindl., from Brazil is known to us only by the description. Its affinity is doubtful, but it is included here because both Lindley and Cogniaux cite it as probably a synonym of *E. latilabre*.

Epidendrum corymbosum Ruiz & Pav., non Lindl., described from two Peruvian collections, is referred to this alliance on the authority of Cogniaux who included it as a questionable synonym under *E. difforme*.

Epidendrum virens Hoffingg., described from material collected near Rio de Janeiro, Brazil, is questionably referable to this alliance. It was described as being close to *E. subumbellatum*, but of more slender habit and with solitary flowers. It was included with a query in synonymy by Cogniaux (in Mart. Fl. Bras. 3, pt. 5 (1898) 139) under *E. latilabre*. This concept is only known to us through the original description.

Epidendrum arachnoideum Rodr. from Rio de Janeiro, Brazil, is, judging from the description, only a gigantic form of *E. difforme*.

Epidendrum chlorocorymbos Schltr. The type collection is Powell 82 from Panama. Specimens of the type collection show the papillose-asperate ovary which Schlechter mentions as a differentiating trait, but this trait is also more or less present in specimens from Salvador and Costa Rica. The lip is much like that of many other specimens of *E. difforme*.

Epidendrum firmum Reichb. f. The type collection is Wendland 1135, from Naranjo-Cartago in Costa Rica. Our tracing of the type shows a caespitose plant with four stems, the tallest of which is about 15 cm. high. The leaves are linear-ligulate, the flowers small, the mid-lobe of the labellum nearly as broad as long and obcordate.

Epidendrum majale Schltr. The type collection is Ad. Tonduz 17620, from San Ramon, Costa Rica. A specimen of this plant proves it to be the same as *E. fir-*

mum Reichb.f.

Epidendrum Storkii Ames was described from a plant collected by H. E. Stork 460, south of Cartago, Costa Rica. The stems are up to 17.5 cm. high, the leaves 2–5.5 cm. long, 7–18 mm. wide. The mid-lobe of the lip is about as broad as long, triangular-acute at the apex. The lamina of the lip is broader than long, 7–11 mm. long, 13.5–16 mm. broad.

Epidendrum simulacrum Ames. The type is from the Province of Chiriqui, Panama, Powell 298. It is a plant 19–24 cm. tall with oblong leaves about 4 cm. long and 1 cm. wide and rather small flowers. The mid-lobe of the lip is much as in *E. Storkii*, but the lamina of the labellum is about as broad as long, 5–6 mm. long, 5–6 mm. broad.

The transition from the typical form of *E. difforme* to var. *firmum*, the transition from var. *firmum* to var. *Storkii*, and again the transition from var. *Storkii* to var. *simulacrum* is clearly shown by the material which we have examined. Allowance being made for these intergrades, three rather constant variants from the typical form may be detected.

Other species which belong to the general alliance, but which have constant differences sufficient to set them apart as distinct species are *Epidendrum pudicum* Ames, *E. Barbeyanum* Kränzl. (*E. Amparoanum* Schltr.) and an undescribed species collected by C. W. Powell in Panama.

Epidendrum difforme *Jacquin*, Enum. Pl. Carib. (1760) 29 and Select. Stirp. Am. (1763) 223, t. 136.

Epidendrum umbellatum Swartz, Prodr. Veg. Ind. Occ. (1788) 121.

Epidendrum umbelliferum J.F. Gmelin, Syst. Veg. (1791) 65.

? *Epidendrum corymbosum* Ruiz & Pavon, Syst. Veg. (1798) 246.
Caularthron umbellatum Rafinesque, Fl. Tellur. 2 (1837) 41.
Epidendrum latilabre Lindley in Bot. Reg. 27 (1841) Misc. p. 77 (as "latilabrum").
? *Epidendrum subumbellatum* Hoffmannsegg in Linnaea 16 (1842) Litt. 232.
? *Epidendrum virens* Hoffmannsegg in Linnaea 16 (1842) Litt. 233.
Epidendrum radiatum Hoffmannsegg, Verz. Orch. (1843) 49 and in Bot. Zeit. 1 (1843) 832, non Lindl.
Epidendrum latilabium Reichenbach filius in Linnaea 25 (1852) 244, *sphalm.*
Epidendrum umbellatum Sw. var. *latilabre* Grisebach, Fl. Brit. W. Ind. (1864) 618.
Epidendrum arachnoideum Rodrigues, Gen. et Spec. Orch. Nov. 1 (1877) 60.
Auliza difformis Small, Fl. Miami (1913) 56.
Epidendrum chlorocorymbos Schlechter in Fedde Repert. Beihefte 17 (1922) 30.
Amphiglottis difformis Britton in Britton & P. Wilson, Bot. Porto Rico & the Virgin Islands 1 (1924) (Sci. Surv. Porto Rico & the Virgin Islands 5, pt. 2) 200.

Rhizome present, but the stems congested and in some cases appearing almost caespitose. Roots generally stout and whitish. Plant 6–47 cm. tall (including the inflorescence). Stems often more or less flexuous, 2–8 mm. in diameter, almost entirely concealed by the persistent flaring (often strongly so) leaf-sheaths. Leaves very variable in shape, ligulate-oblong to broadly oval-elliptic, 1.3–11 cm. long, 4–34 mm. wide, rounded to slightly bilobed at the apex. Inflorescence terminal, one- to several-flowered (usually three or more), subumbellate to um-

bellate. Flowers very variable in size, long-pedicellate. Lateral sepals oblong, lanceolate or elliptic to oblanceolate or obovate, 11–32 mm. long, 4.5–9 mm. wide, obtuse (rarely) to short-acuminate at the apex. Dorsal sepal lanceolate or oblong-lanceolate to oblanceolate or oblong-obovate, 10.5–34 mm. long, 3.8–8 mm. wide, subobtuse to short-acuminate at the apex. Petals filiform or linear-elliptic to broadly oblanceolate, 10–31 mm. long, .8–7 mm. wide, obtuse to acute or very rarely acuminate at the apex. Labellum nearly simple to trilobulate, transversely subquadrate (rarely) to reniform or transversely oval in general outline; lamina 7–18 mm. long, 1–3.4 cm. wide; mid-lobe wanting or obscure to well developed, when developed usually transversely oblong to semi-elliptic, entire to crenate or bilobed, retuse, truncate or apiculate at the apex; disc with two basal calli and more or less thickened nerves. Column adnate to the lip its entire length, dilated above; clinandrium slightly crenulate, denticulate or dentate to lacerate.

Epidendrum difforme *Jacq.* var. **firmum** (*Reichb.f.*) *Ames, Hubbard & Schweinfurth, comb. nov.*

Epidendrum firmum Reichenbach filius, Beitr. Orch. Centr. Am. (1866) 87.

Epidendrum majale Schlechter in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 406.

Plant including the inflorescence 10–40 cm. tall. Stems congested, differing little in thickness from the typical form. Leaves linear-ligulate or narrowly lanceolate to oval-elliptic, 1.5–9 cm. long, 2–25 mm. wide, obliquely bilobulate at the apex. Lateral sepals obliquely elliptic-lanceolate to oblanceolate-oblong, 11–22 mm. long, 4.5–6.9 mm. wide, more or less carinate on the exterior surface especially toward the apex which is acute or acuminate. Dorsal sepal elliptic, oblanceolate or oblanceo-

late-oblong, 11–22 mm. long, 3.2–7 mm. wide, often slightly carinate at the apex on the exterior surface, subacute to short-acuminate at the apex. Petals filiform- or linear-spatulate to linear-oblanceolate, 10.8–20 mm. long, 1.2–2 mm. wide, obtuse to acute. Labellum much like the typical form in general outline, 5–19 mm. long, 8.5–20 mm. wide, distinctly 3-lobed; mid-lobe usually rather subquadrate, rarely tending to reniform or quadrate-ovate, its apex truncate or retuse or somewhat bilobed, often apiculate; disc much as in the typical form with two basal calli, but the mid-nerve is apt to be thickened even to the apex of the lip. Column adnate to the claw of the lip and its clinandrium lacerate or rarely only dentate.

Var. *firmum* is set off from the typical form by having the mid-lobe of the lip at most little broader than long, subquadrate. From var. *Storkii* and var. *simulacrum* it is separable by the truncate, retuse or somewhat bilobed apex of the mid-lobe of the lip. The leaves in typical var. *firmum* are often narrower than in the typical form of the species, but they are not constant in this respect.

Epidendrum difforme *Jacq.* var. **Storkii** (*Ames*) *Ames, Hubbard & Schweinfurth, comb. nov.*

Epidendrum Storkii Ames in Sched. Orch. 7 (1924) 10.

Plant 12–37 cm. tall (including the inflorescence). Stems usually rather stout and congested. Leaves oblong- or lanceolate-elliptic to elliptic, 1.5–8.3 cm. long, 5–25 mm. wide, unequally bilobed at the obtuse apex. Leaf-sheaths complanate and dilated upward. Inflorescence terminal, subumbellate, 2–6-flowered. Flowers medium-sized, greenish, long-pedicelled. Lateral sepals oblong or elliptic-lanceolate to oblanceolate or oblong-elliptic, 16–22 mm. long, 5–6 mm. wide, slightly asymmetric, acute or acuminate, thickened and slightly carinate at the tip.

Dorsal sepal oblong-elliptic to oblanceolate, 16–23 mm. long, 4–6 mm. wide, obtuse to acute, somewhat thickened and carinate at the tip, tending to be revolute on the margin. Lamina of the lip subquadrate-ovate or subquadrate-reniform in general outline, 7–11 mm. long, 13.5–16 mm. broad, distinctly 3-lobed; mid-lobe quadrate to subquadrate-ovate, apex usually triangular acute and apiculate or rarely truncate and slightly retuse (transition to var. *firmum*). Column as in other forms, with the clinandrium usually lacerate or rarely only denticulate.

Var. *Storkii* grades into both var. *firmum* and the typical form of the species and in a lesser degree into var. *simulacrum*. From the species proper and from var. *firmum* it is separable by the triangular-acute apex of the mid-lobe of the labellum. From var. *simulacrum* the shape and larger size of the lip separate it clearly.

Epidendrum difforme *Jacq.* var. **simulacrum** (*Ames*) *Ames, Hubbard & Schweinfurth, comb. nov.*

Epidendrum simulacrum Ames in Sched. Orch. 6 (1923) 75.

Plant including the inflorescence 18–26 cm. tall. Stem rather more slender than its nearest ally var. *Storkii*, somewhat flexuous. Leaves oblong, narrowed toward the ends, 1–4 cm. long, 2–10 mm. wide, about 4 cm. apart, obtusely and unequally bilobed at the tip. Flowers smaller than commonly the case in the other forms, borne in umbel-like clusters. Pedicel with the ovary slender, up to 3 cm. long. Lateral sepals obliquely elliptic-oblanceolate, 9–10 mm. long, 3 mm. wide, apex thickened and carinate on the exterior surface and short-acuminate. Dorsal sepal oblong-elliptic, about 10 mm. long, 2.5 mm. wide, thickened and revolute-margined at the apex, short-acuminate. Petals linear-spatulate, about 9 mm. long, 1 mm. wide, subacute. Labellum with a suborbicular-

cordate lamina about 5–6 mm. long and broad; mid-lobe shallowly trilobulate to undulate-simple, apiculate; disc biallose at base with the center marked by three more or less thickened nerves. Column arcuate, adnate to the lip for its entire length; clinandrium minutely denticulate.

Var. *simulacrum* approaches var. *Storkii* most closely, but is separable by its almost orbicular and smaller lip. It differs from exceptionally small-flowered specimens of the typical form of the species in having the mid-lobe of the lip little broader than long.

Epidendrum paniculatum alliance

The members forming this alliance, geographically extending over a much larger area than the two alliances already discussed, show great variation in both vegetative and floral characters. These variations, however, do not seem to indicate the presence of several different species, indeed they do not seem to exhibit sufficiently stable characters through which to segregate varieties. It appears to us, therefore, after careful study of an abundance of material, that a single polymorphic species is represented. Closely allied to this polymorphic species, but capable of clear separation, are several other species. The earliest specific name applied to a member of this alliance is *Epidendrum paniculatum* Ruiz & Pav. and this name, we believe, should be adopted for the polymorphic species.

Epidendrum paniculatum was described by Ruiz and Pavon as follows: "E. foliis oblongo-lanceolatis, floribus paniculatis, nectarii lacinia intermedia bifida; lacinulis extrorsum flexis." While this description is too indefinite to place the plant with certainty, it appears capable of application to only six species (including *E. paniculatum*) which have been reported from Peru, the type locality of the species, all of which belong to this general alliance. In the absence of a knowledge of the specimens upon

which this species was based, it seems advisable to accept Lindley's interpretation of *E. paniculatum*, particularly in view of the fact that he had seen a Pavon plant from Peru, in Herb. Lambert, collected in Huayaquil: the type was collected in Muña. Lindley described the plant as having oblong-lanceolate acuminate leaves, a many-flowered crowded panicle, oblong sepals externally varicose on the veins, filiform petals, and a 4-lobed labellum of which the forward lobes are divaricate and linear. In Folia Orchidacea Epidendrum (1853) 56, Lindley cites as representative of *E. paniculatum*, among other collections, Funck & Schlim 1448 and Schlim 68. We have photographs of these sheets which are characteristic of the conception of *E. paniculatum* widely prevalent today. This form has been reported from Martinique, Colombia, Venezuela, Ecuador, Bolivia and Peru and belongs to one of the two basic groups into which the alliance has been previously divided. The other group is represented by *Epidendrum floribundum* HBK. of which the type collection is from Brazil and represents a species which is distributed through Mexico and Central America extending southward to Brazil, Ecuador and Peru in South America. It is described and illustrated (upper portion only) by Humboldt, Bonpland & Kunth (Nov. Gen. et Sp. Pl. 1 (1816) 353, t. 86) as a plant about a foot high with elliptic-lanceolate acuminate leaves and with a rather open panicle, the branches subtended by lanceolate acuminate bracts which are up to 3.8 cm. long. The flowers are about 1.5 cm. across, with lanceolate acuminate and reflexed sepals about 1 cm. long. The petals are linear-spatulate and slightly longer; the lip is 4-lobed with an elongate tubular claw which is adnate to the column. The lateral lobes of the lip are subrotund-quadrate and the mid-lobe is transversely linear-oblong with divaricate lobules, separated from the lateral lobes by a much-nar-

rowed portion; the lobules are at right angles to the median axis, with acute apices, slightly retrorse and falcate-oblanceolate in outline and from tip to tip much exceed the lateral lobes in spread; disc with two basal calli and a central somewhat rhombic thickening which extends upon the mid-lobe. Column clavate, extending to the base of the lateral lobes of the lip.

Critical examination of the material referred to *E. paniculatum* and *E. floribundum* leads us to believe that these concepts are not separable from each other although Lindley and Reichenbach kept them distinct. Lindley in Folia Orchidacea placed them in different sections of the genus, *E. paniculatum* in Amphiglottium (Polyclada) and *E. floribundum* in Euepidendrum (Paniculata). It is noteworthy, however, that Lindley cites Funck & Schlim 1448 under both species, and under *E. floribundum* makes the following comment: "A great branching green-flowered species, very much like *E. paniculatum* and *laxum*, differing however in the want of spathaceous bracts." We take occasion to note here that we do not feel that *E. laxum* belongs to this alliance and that the presence or absence of spathaceous bracts has not proved to be a valid character upon which to separate species in the genus Epidendrum.

From each of these basic groups or species (*E. paniculatum* and *E. floribundum*) there have been segregated, from time to time, many so-called species and varieties. However, since we are unable to separate the basic groups, it is obvious that segregates from them are open to question. Of the several parts of the plant showing the variations upon which segregation has been based, the labellum (especially the mid-lobe) is the one most often emphasized by authors. The differences in this part, however, are very inconstant and vary with regard to length and breadth of the lobules, type of sinus or isthmus between

the mid-lobe and the lateral lobes, in the degree and direction (antrorse or retrorse) of divergence and in other respects. Taken as a whole these variations are not correlated with other characters and should be regarded as individual rather than as specific or varietal differences. Likewise the shape of the leaf, the habit of the plant and the simple or compound character (racemose or paniculate) of the inflorescence do not constitute valid characters for the recognition of more than one species.

The species and varieties usually considered distinct, but which we believe comprise a polymorphic species, are briefly characterized as follows:

Epidendrum densiflorum Hook. The type collection was made in Mexico by Parkinson. The plate in Curtis's Botanical Magazine shows rather broad elliptic leaves and a dense panicle of greenish flowers slightly tinged with brownish purple. The sepals are reflexed and elliptic-oblanceolate; the petals are slightly shorter than the sepals and narrowly spatulate; the lip is 3-lobed. The lateral lobes of the lip are shortly dolabriform and the mid-lobe is transverse, composed of two triangular divaricate lobules (separated from the lateral lobes by a narrow slit), with its apex retuse. The spread of the lobules of the mid-lobe from tip to tip is less than that of the lateral lobes.

Epidendrum rubrocinctum Lindl. was described from a plant sent to Lindley by Bateman from the garden of Mr. Brocklehurst. It is described as having an ample nodding paniele and is usually considered to be the same form as *E. densiflorum*.

Epidendrum laeve Lindl. Discovered by Hartweg at Pasto, Popayan, Colombia. A form with lanceolate leaves and simple many-flowered paniele. The lip was described as 4-lobed, the posterior lobes cuneate-rotundate, the anterior lobes linear and divaricate. Said to be allied to *E. paniculatum*.

Epidendrum ornatum Lem. Said to have been sent to Van Houtte from the Belgian colony of Santo Thomas [where?]. It was described as having a nodding simple raceme, and the leaves, varying from narrowly oblong to lanceolate, were said to be violet. The sepals were described as fleshy, oblong-cochleate and verrueulose outside; the lip 3-lobed and coriaceous. The lateral lobes of the lip are irregularly rotundate; the mid-lobe has oblong, obtuse, divaricate lobules. The disc is tricarinate and at base bituberculate. The flowers are green, the lip white with red stripes forming a spot.

Epidendrum floribundum HBK. var. *lilacinum* Reichb.f. was described from plants collected in Venezuela at Merida (Moritz no. 233) and in Colombia at Pamplona (Funck & Schlim no. 1448). The perianth segments are purple outside, the lip is white.

Epidendrum paniculatum Ruiz & Pav. var. *cuspidatum* Lindl. Type collection from Peru (Matthews). The chief character given by Lindley is the oblong, suddenly cuspidate leaves.

Epidendrum paniculatum Ruiz & Pav. var. *longicrure* Lindl. was described from specimens from Peru (McLean) and Bolivia (Bridges). Lindley set them off from *E. paniculatum* as follows: "Leaves very acuminate. Front lobes of lip very long and falcate."

Epidendrum polyanthum Lindl. var. *densiflorum* (Hook.) Lindl. is based on *E. densiflorum* Hook.

Epidendrum floribundum HBK. var. *concavum* Lindl. was based on a Hartweg plant from the Hacienda de Palmas, near Guaduas, Colombia. It is thus diagnosed by Lindley: "Flowers smaller, shorter, with a roundish, denticulate, obscurely four-lobed lip."

Epidendrum turialvae Reichb.f. of which the type is from Turialba, Costa Rica, collected by Wendland. Reichenbach also had a specimen from W. Saunders.

The Reichenbach drawing of the upper portion of the plant shows two linear-lanceolate leaves about 15 cm. long and 1 cm. wide surmounting a stem concealed by persistent leaf-sheaths. Peduncle up to the inflorescence slender, about 12 cm. long, with three or four close tubular sheaths. Inflorescence racemose. Flowers rather small for the alliance, subtended by scale-like bracts. Sepals and petals reflexed. Lip 4-lobed; lateral lobes subrotund; mid-lobe transverse, composed of two divaricate falcate lobules whose spread exceeds that of the lateral lobes, separated from the lateral lobes by a deep rounded sinus. In recent years Dr. Schlechter has determined as *E. turialvae* specimens with elliptic leaves and well-developed paniculate inflorescences. This concept of *E. turialvae* seems to us to be erroneous.

Epidendrum piliferum Reichb. f. of which the type is a Warscewicz plant from Chiriqui, Costa Rica. On the basis of photographs of material in the Reichenbachian Herbarium, Reichenbach's interpretation would seem to be a plant with broadly elliptic acuminate leaves and a long-branched panicle, the branches recurved. The lobules of the mid-lobe are long and falcate-oblong.

Epidendrum resectum Reichb. f. Type sent to Veitch by Zahn from Chiriqui, Costa Rica. Described as having oblong-ligulate leaves (lanceolate, judged by the Reichenbach drawing) and a branched panicle. Reichenbach's drawing shows reflexed sepals and petals, the former oblong-lanceolate. The lip is 3-lobed; the lateral lobes semi-orbicular, more acute at their anterior end; the mid-lobe is 2-lobulate with an apicule between the porrectly divergent cuneate-oblong lobules whose spread is much exceeded by that of the lateral lobes. The base of the mid-lobe is cuneate, and as the apical portion of the lateral lobes extends forward beyond the base of the mid-lobe the deep sinus is well-marked.

Epidendrum falsiloquum Reichb.f. was described (from living material sent to Reichenbach by W. Bull) as having linear acuminate leaves, with purple lines on the sheaths and "The anterior lacinia of the lip has its from its narrow base two diverging linear blunt shanks...."

Epidendrum Englerianum Lehm. & Kränzl. of which the type collection is from Tunguragua, Ecuador, Lehmann no. 6721 (Lehmann no. 6722 is also cited). Both numbers are represented in Herb. Ames. The plants range in height from 30–43 cm. including the inflorescence and are relatively slender. The leaves are narrowly lanceolate and acuminate, 3.5–11 cm. long, 4–13 mm. broad. Inflorescence terminal, simply and openly paniculate, up to 15 cm. long including the peduncle which has one or two slightly spreading spathe-like bracts; these are narrowly lanceolate, long-acuminate and up to 4.5 cm. long. Flowers about medium-sized (for the alliance). Lateral lobes of the labellum obliquely oval-alate. Mid-lobe of the labellum separated from the laterals by a distinct isthmus, its lobules linear-spatulate, divergent-falcate and truncately obtuse. Column only reaching to the base of the lateral lobes of the lip.

Epidendrum frons bovis Kränzl. was described from specimens collected north of Moyobamba, Department of Loreto, Province of Moyobamba, Peru, by Weberbauer no. 4639. Judging from the description and a photograph of the type sheet, it differs little vegetatively from normal *E. paniculatum*. The lateral lobes of the labellum are transversely and obliquely oval, deeply auriculate-cordate at base and their anterior margin is at right angles to the median axis of the labellum. The mid-lobe is separated from each lateral lobe by a narrow sinus, is 2-lobulate and the lobules are very divaricately falcate-oblong, their spread much exceeding that of the lateral lobes.

Epidendrum ionodesme Schltr. The type is from Cauca, Colombia, Langlassé no. 98. It was described as about 60 cm. tall with oblong-ligulate leaves 11–13 cm. long, 2.5–3 cm. wide and with a many-branched panicle. As later illustrated (Fedde Repert. Beihefte 57 (1929) t. 47, Nr. 182) the lip has the spread of the lobules of the mid-lobe about equal to that of the lateral lobes. The lobules of the mid-lobe are obliquely divergent, linear-oblong and obtuse.

Epidendrum longiscure Schltr., collected by Madero in Cauca, Colombia, is most noticeable (as shown by the figure in Fedde Repert. Beihefte 57 (1929) t. 48, Nr. 186)in having very long obliquely divergent linear-oblong obtuse lobules of the mid-lobe which form an inverted V and in having the lateral lobes of the labellum obliquely triangular-ovate. The anterior margin of the lateral lobes is about at right angles to the median axis.

Epidendrum macroceras Schltr. of which the type is H.Smith no. 2418 from Santa Marta, Colombia, is figured (Fedde Repert. Beihefte 57 (1929) t. 48, Nr. 187) as having a lip with obliquely rounded-dolabriform lateral lobes and a mid-lobe with falcately oblong-lanceolate divaricate lobules whose spread is nearly double that of the lateral lobes.

Epidendrum atacazoicum Schltr. (the type from Atacazo, Ecuador, collected by Sodiro, April 1900) is figured (Fedde Repert. Beihefte 57 (1929) t. 86, Nr. 334) as having the lateral lobes of the lip obliquely dolabriform and the mid-lobe as consisting of two divergent rather rectangular lobules whose spread is less than that of the lateral lobes.

Epidendrum bifalce Schltr. of which the type is Sodiro no. 63, collected on Mt. Chimborazo, Ecuador. It is figured (Fedde Repert. Beihefte 57 (1929) t. 116, Nr. 457) as having the lateral lobes of the lip asymmetrically

subquadrate, with the lateral margin crenulate-dentate; the lobules of the mid-lobe, forming an inverted V, are linear-oblong and obtuse. Dise with three elongated calli the lateral ones divergent [?].

Epidendrum caloglossum Schltr., of which the type collected by Sodiro, is from Pichincha, Ecuador. The lip is illustrated (Fedde Repert. Beihefte 57 (1929) t. 86, Nr. 336) as having very undulate-crenulate lateral margins on the obliquely quadrate-dolabriform lateral lobes and divaricate somewhat falcate rectangular-oblong lobules on the mid-lobe, their spread less than that of the lateral lobes.

Epidendrum isthmi Schltr., of which the type collection is Powell no. 104 from hills near Panama City, Panama. The type number is a plant with large elliptic-lanceolate leaves and a branched paniele. The most noticeable point of variance is the laciniate-dentate lateral margin of the lateral lobes as well as of the lobules of the mid-lobe of the lip. The lip is white with a greenish edge.

Epidendrum reflexum A. & S. The type is Valerio no. 61 collected at Arenal, Costa Rica. A restudy of the material fails to show any characters which will differentiate it from *E. paniculatum*. The leaves are lanceolate to oblong-lanceolate and the inflorescence is arcuate, racemose and shorter than the leaves (in this character suggesting *E. resectum* Reichb. f.).

Making due allowance for individual variation, it seems to us that all of the forms which have just been discussed should be considered as a single species. Other members of the general alliance, but possessing characters sufficiently diagnostic to separate them as distinct species, are *Epidendrum gratiosum* Reichb. f., *E. capricornu* Kränzl., *E. subnutans* A. & S. and *E. hondurense* Ames.

In 1924, Dr. Schlechter described two species of this alliance from Colombia, *E. Arnoldi* and *E. subfloribundum*. These are known to us only through the original

descriptions and may or may not be separable from *E. paniculatum*. The status of one member of this alliance (*E. fastigiatum* Lindl.) is in doubt, as it is only known to us through the original description and a photograph of the type sheet in the Lindley herbarium on which Lindley has made drawings including one of the lip. Judging by the aspect of the plant and this drawing of the lip, it would seem that *E. fastigiatum* Lindl. is only a synonym of *E. paniculatum*, but the evidence is not convincing enough to warrant reduction. Two other members of this general alliance, -*E. parviflorum* Ruiz & Pav. and *E. patulipetalum* Schltr. (which we believe represent one species) differ from *E. paniculatum* chiefly in their smaller flowers. The petals and sepals are only 5 mm. long and the lamina of the lip 1.5 mm. long, 3 mm. wide. As these species are unknown to us through authentic specimens, it seems inadvisable to reduce them, though our feeling is that they merely represent exceptionally small-flowered forms of *E. paniculatum*.

Epidendrum paniculatum *Ruiz & Pavon*, Syst. Veg. (1798) 243.

Epidendrum floribundum Humboldt, Bonpland & Kunth, Nov. Gen. et Sp. 1 (1816) 353 (Quarto ed.), 283 (Folio ed.), t. 86.
Epidendrum densiflorum Hooker in Bot. Mag. 66 (1840) t. 3791.
Epidendrum rubrocinctum Lindley in Bot. Reg. 29 (1843) Misc. p. 9.
Epidendrum laeve Lindley in Bot. Reg. 30 (1844) Misc. p. 24.
Epidendrum ornatum Lemaire in Fl. des Serres 4 (1848) 334 B.
Epidendrum floribundum HBK. var. *lilacinum* Reichenbach filius in Linnaea 22 (1849) 840.

Epidendrum paniculatum Ruiz & Pav. var. *cuspidatum* Lindley, Fol. Orch. Epid. (1853) p. 56.
Epidendrum paniculatum Ruiz & Pav. var. *longicrure* Lindley, Fol. Orch. Epid. (1853) p. 56.
Epidendrum polyanthum Lindl. var. *densiflorum* (Hook.) Lindley, Fol. Orch. Epid. (1853) p. 60.
Epidendrum floribundum HBK. var. *conveanum* Lindley, Fol. Orch. Epid. (1853) p. 91.
Epidendrum syringaeflorum Warscewicz apud Reichenbach filius in Bonpl. 2 (1854) 111, in textu, *nomen* — Schlechter in Fedde Repert. Beihefte 7 (1920) 250, in synon. (as *syringiflorum*).
Epidendrum turialvae Reichenbach filius in Gard. Chron. (1871) 1678 — Schlechter in Fedde Repert. Beihefte 17 (1922) 42 (as *Turialbae*).
Epidendrum resectum Reichenbach filius in Linnaea 41 (1876) 82.
Epidendrum piliferum Reichenbach filius in Linnaea 41 (1876) 83.
Epidendrum falsiloquum Reichenbach filius in Gard. Chron. ser. 2, 23 (1885) 566.
Epidendrum Englerianum Lehmann & Kränzlin in Engl. Bot. Jahrb. 26 (1899) 466.
Epidendrum frons bovis Kränzlin in Fedde Repert. 1 (1905) 181.
Epidendrum ionodesme Schlechter in Fedde Repert. Beihefte 7 (1920) 134; 57 (1929) t. 47, Nr. 182.
Epidendrum longicrure Schlechter in Fedde Repert. Beihefte 7 (1920) 137; 57 (1929) t. 48, Nr. 186.
Epidendrum macroceras Schlechter in Fedde Repert. Beihefte 7 (1920) 138; 57 (1929) t. 48, Nr. 187.
Epidendrum ataazoicum Schlechter in Fedde Repert. Beihefte 8 (1921) 67; 57 (1929) t. 86, Nr. 334.
Epidendrum bifalce Schlechter in Fedde Repert. Beihefte 8 (1921) 67; 57 (1929) t. 116, Nr. 457.

Epidendrum caloglossum Schlechter in Fedde Repert. Beihefte 8 (1921) 68; 57 (1929) t. 86, Nr. 336.
Epidendrum Isthmi Schlechter in Fedde Repert. Beihefte 17 (1922) 34.
Epidendrum reflexum Ames & Schweinfurth in Sched. Orch. 8 (1925) 49.

Plant caespitose, variable in height and stoutness, up to 1.4 m. tall including the inflorescence. Stems simple, erect, ranging from rather slender to stout, 2 up to 20 mm. (possibly more) in diameter, entirely concealed by leaf-sheaths or their fibrous remains. Leaves linear-lanceolate to elliptic or elliptic-oval, 4–25 cm. long, .5–6.8 cm. wide, acute to long-acuminate or sometimes cuspidate at the apex and usually narrowed toward the base, submembranaceous to subcoriaceous in texture, often purplish on the under surface or purple-veined according to authors. Peduncle below the inflorescence variable in length and diameter, from almost wanting up to 18 cm. (perhaps more) long, with or without a subtending spathe; spathe, if present, up to 9 cm. long and 14 mm. wide; there may also be present on the peduncle from one to five spathe-like sheaths which are variable in size, up to 6 cm. long and 8 mm. wide, usually acuminate and appressed. Inflorescence terminal, much exceeding the leaves or in some forms much surpassed by the leaves (*E. reflexum* and *E. resectum*), ranging from a simple few-flowered raceme to a compound panicle which may be open or densely flowered; branches of the panicle very variable in length and in the degree of divergence from the rachis (almost retrorse in some instances). Bracts of the inflorescence exceedingly variable, from small and inconspicuous to large and spreading, up to 7 cm. long and 6.5 mm. wide, usually lanceolate and acuminate. Floral bracts small, lanceolate to ovate, acute to acuminate. Flowers very variable in size, usually with the sepals reflexed and

the petals spreading or reflexed. Lateral sepals oblong-lanceolate, oblong-spatulate or rarely oblong-elliptic (sometimes obliquely so), 8.2–16 mm. long, 2.5–4.5 mm. wide, often concave especially toward the tip which is commonly somewhat thickened and subcarinate, subacute to acuminate-acute at the apex, smooth or asperate on the outer surface. Dorsal sepal somewhat narrower than the laterals, oblong-oblanceolate, cuneate-spatulate or narrowly elliptic, 8.2–16 mm. long, 2–3.5 mm. wide, subacute to acuminate-acute at the apex. Petals filiform, narrowly oblanceolate or oblong-spatulate, 8–14.5 mm. long, .3–2 mm. wide, obtuse to acute at the apex, the margins toward the apex sometimes minutely denticulate. Labellum with a long claw which is adnate to the column; lamina ranging from nearly simple to 3- or 4-lobed, in general outline transversely subrectangular to subrotund or subquadrate, 4–9 mm. long, 5.8–12 mm. wide across the lateral lobes; lateral lobes very variable, being shallowly dolabriform, dolabriform, obliquely rhombic-dolabriform, obliquely triangular-ovate, obliquely ovate, obliquely oval or subrectangular, the posterior margin or angle is usually rounded forming a more or less cordate base, the anterior margin or angle is porrect or at right angles to the median axis, and in some instances bears a small upright lobule at its outer edge, the lateral margin of the lateral lobes varies from subentire to somewhat bilobular or undulate to somewhat lacerate (*E. isthmi* form); mid-lobe variable ranging from broadly truncate-cuneate to long-bilobulate, truncate, retuse (due to the porrect lobules) or protuberant and often apiculate at the apex. The lobules of the mid-lobe are exceedingly variable in shape and degree of divergence, ranging in shape from acinaciform through linear or falcately linear-oblong to narrowly triangular or else to oblong, spatulate-oblong or narrowly rectangular. The degree of divergence is from

V-shaped to right-angled with the median axis or to somewhat retrorse. The lobules, 3–8 mm. long (measured from the central axis of the mid-lobe to their apex), are truncate or rounded to acuminate-acute at their apex which is sometimes somewhat lacerate (*E. isthmi* form) and are separated from the lateral lobes by a mere slit or the separation may consist of a well-marked isthmus. The disc bears at the base two more or less lamellate calli and is centrally thickened with three more or less developed approximate parallel ridges of which the central one extends upon the mid-lobe and in some instances reaches the apicule. Column entirely adnate to the lip, clavate-dilated from a slender tubular shank, often somewhat arcuate; clinandrium usually provided with a more or less developed tooth on each side.

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A CONTRIBUTION TO OUR KNOWLEDGE OF THE ORCHIDS OF SPANISH HONDURAS PART I

BY

OAKES AMES

WILLIAM BOTTING HEMSLEY, in 1883, published in Godman and Salvin's Biologia Centrali-Americana, an enumeration of the plants that had been collected in Middle America. For the Republic of Honduras he found records of less than one hundred and sixty species including four orchids, and of these several were cited in his enumeration on questionable evidence. He stated that his only reason for giving Honduras a place in his geographical tables was to show how little was then known about the Honduranian flora. Rudolf Schlechter, in 1918, published his Kritische Aufzählung der bisher aus Zentral-Amerika bekanntgewordenen Orchidaceen. For Honduras he cited every species of orchid for which he found a record. In his remarks about the flora he simply reiterated the statement made by Hemsley and characterized Honduras as being botanically the least known of the Central American countries. He included fifteen genera and eighteen species of orchids in his enumeration. We know now that two of these species are from British rather than Spanish Honduras and that two are as yet not known to be natives of Central America.

Until 1923, orchidological exploration in Honduras

had hardly begun. Up to that year a few collectors had visited the Atlantic ports. Carl Thiéme, between 1887 and 1890, had explored the country around San Pedro Sula in the Department of Santa Barbara. Gustav Niederlein in 1898 made a collection of about 459 numbered specimens in the vicinity of Tegucigalpa, and H. Pittier in 1919 made botanical collections in Copán. But none of these men specialized in orchids and their contributions to orchidology were inconsiderable. Indeed, they added very few species to the list prepared by Hemsley for his enumeration.

Since 1923 our knowledge of the orchid flora of Honduras has been rapidly increased. In March 1923, I spent about three weeks near the Atlantic coast collecting in the Departments of Atlántida, Yoro and Colón where I found thirty-five genera and seventy-nine species. In 1923 and in 1929, Herbert J. Spinden, while conducting archiological investigations in the Departments of Colón and Copán, collected orchids as a diversion. He rediscovered the rare *Laelia Wendlandii* Reichb.f. and added *Brassavola cucullata* (L.) R. Br., *Brassia caudata* Lindl., *Epidendrum chinense* (Lindl.) Ames and *Epidendrum abbreviatum* Schltr. to the list of recorded species. In 1926, Mrs. Elizabeth R. Mitchell made a small collection of plants near Tela, but only two orchids, namely *Ionopsis utricularioides* Lindl. and *Maxillaria tenuifolia* Lindl. are represented among the specimens I have examined. From December 6, 1927 to March 20, 1928, Paul C. Standley collected intensively in the Lancetilla Valley[1] near Tela in the Department of Atlántida, and spent part of his time exploring the country around Siguatepeque. Standley found fifty-eight species representing thirty-one genera of orchids. In March and April 1931, Marston

[1] Flora of the Lancetilla Valley, Honduras, in Field Museum of Natural History, Botanical Series vol. 10, Publication 283. (1931)

Bates entered Honduras from the Pacific coast and explored the country through which he passed in approaching Tegucigalpa and Danli from Ampala and Choluteca, and then, beginning in July 1931, James Brannon Edwards, working for the Arnold Arboretum of Harvard University, explored in the Departments of Tegucigalpa, Comayagua, Cortés and Yoro, adding materially to our records of the orchid flora and supplying specimens that shed helpful light on several perplexing problems.

Before passing to a consideration of the orchid flora of Honduras as it is now known, I think it may be helpful to give a list of the species cited by Schlechter, together with a list of the species reported from Honduras up to the year 1923.

Schlechter's list is as follows:[1] (The species followed by an asterisk are cited from Honduras in Hemsley's enumeration.)

1. Bletia tuberosa (*L.*) *Ames* as Bletia alta (*L.*) *Hitchc.*
2. Brassavola nodosa (*L.*) *Lindl.**
3. Catasetum maculatum *Kunth** Probably referable to C. integerrimum *Hook.*
4. *Cattleya Boweringiana* Veitch
5. *Coryanthes picturata* Reichb.f.
6. *Epidendrum gratiosum* Reichb.f.
7. Epidendrum stenopetalum *Hook.**
8. Laelia rubescens *Lindl.*
9. *Oncidium excavatum* Lindl.*

[1] Spiranthes is assigned three species in Schlechter's table of genera, but only one, namely *Spiranthes hondurensis* Schltr., is referred to Honduras in the list of species. On page 349 of his enumeration, Schlechter assigned Habenaria to the genera coming from Honduras, but in his table of genera on page 368 he omitted this genus and under the Central American species he failed to cite Honduras as a locality from which material had been recorded.

10. Pleurothallis longissima *Lindl.* as Pleurothallis Niederleinii *Schltr.*
11. Polystachya clavata *Lindl.*
12. Sarcoglottis Thelymitra (*Reichb.f.*) *Ames* as Spiranthes hondurensis *Schltr.*
13. Stenorrhynchus orchioides (*Sw.*) *L.C.Rich.*
14. Stenorrhynchus speciosus (*Sw.*) *L.C.Rich.*
15. Trigonidium Egertonianum *Batem.*
16. Vanilla fragrans (*Salisb.*) *Ames* as Vanilla planifolia *Andrews*

The names printed in italics represent species that are doubtful. *Cattleya Boweringiana* Veitch was originally collected in British Honduras. I have failed to find any evidence of its occurrence in Honduras. *Coryanthes picturata* Reichb.f. was originally found near Belize in British Honduras. When in Orchis 10(1916)72, Schlechter monographed the genus Coryanthes, he failed to cite Belize as the type locality of *C. picturata*, and it would seem that he carried over the error of that earlier publication when he prepared his enumeration published in 1918, because in his table of genera he failed to add Coryanthes to the genera native to British Honduras and assigned one species to Coryanthes in the column devoted to the genera of Spanish Honduras. *Epidendrum gratiosum* Reichb.f. was originally reported from South America. No authentic material from Central America has been noted and it is very probable that the extension of range rests on an erroneous identification. *Oncidium excavatum* Lindl. is a native of Peru and Ecuador. I have not seen any Central American specimens referable to it. It is significant that Fritz Kränzlin in his monograph of Oncidium did not cite specimens of this species from Central America.

At the beginning of 1923, the orchid flora of Honduras, from the records I had made, comprised fourteen

genera and twenty-one species as follows:

1. Bletia tuberosa (*L.*) *Ames*
2. Brassavola nodosa (*L.*) *Lindl.*
3. Catasetum integerrimum *Hook.*
4. Catasetum viridiflavum *Hook.* cf. Addisonia 2 (1917) sub t. 53
5. Epidendrum paleaceum (*Lindl.*) *Reichb.f.*
6. Epidendrum Stamfordianum *Batem.*
7. Epidendrum stenopetalum *Hook.*
8. Epidendrum xipheres *Reichb.f.*
9. Erythrodes vaginata (*Hook.*) *Ames*
10. Laelia rubescens *Lindl.*
11. Liparis elata *Lindl.*
12. Oncidium pusillum (*L.*) *Reichb.f.*
13. Oncidium sphacelatum *Lindl.*
14. Pleurothallis longissima *Lindl.*
15. Pleurothallis stenostachya *Reichb.f.*
16. Sarcoglottis Thelymitra (*Reichb.f.*) *Ames*
17. Schomburgkia tibicinis *Batem.*
18. Stenorrhynchus orchioides (*Sw.*) *L.C.Rich.*
19. Stenorrhynchus speciosus (*Sw.*) *L.C.Rich.*
20. Trigonidium Egertonianum *Batem.*
21. Vanilla fragrans (*Salisb.*) *Ames*

The lists of genera and species given above are interesting chiefly as evidence that the botanical exploration of Honduras had progressed very slowly in the thirty-five years that passed following the publication of Hemsley's enumeration and the appearance of Schlechter's critical survey of the orchid flora of Middle America, a space of time in which the countries north and south had been yielding a rich harvest to botanical and horticultural collectors. Indeed, until recent times our knowledge of the Honduranian flora had remained so inconsiderable that one would hesitate before using it in a comparative study of orchid distribution in the countries of Middle America.

Although it is yet early to generalize with regard to the characteristics of the Honduranian orchid flora as it is related to the floras of Mexico, Guatemala, Salvador, Nicaragua, British Honduras, Costa Rica and Panama, a synopsis of the major groups while indicating the substantial increase that has been made in the number of genera since Schlechter's enumeration was published sixteen years agomay prove useful tostudents whose interests centre in the broader aspects of plant distribution.

A Synopsis of the Genera based on Schlechter's System of Classification

I. Habenarieae

1. Habenaria *Willdenow*, Sp. Pl. 4, pt. 1 (1805) 44.

II. Vanilleae

2. Vanilla *Swartz* in Nov. Act. Ups. 6 (1799) 66, t. 5.

III. Sobralieae

3. Elleanthus *Presl*, Rel. Haenk. 1 (1830) 97.
4. Sobralia *Ruiz & Pavon*, Fl. Peruv. et Chil. Prodr. (1794) 120, t. 26.

IV. Bletilleae

5. Crybe *Lindley*, Nat. Syst. Bot. ed. 2 (1836) 446.

V. Cranichideae

6. Wullschlaegelia *Reichenbach filius* in Bot. Zeit. 21 (1863) 131.
7. Prescottia *Lindley* in Hooker, Exot. Fl. 2 (1824) t. 115.
8. Cranichis *Swartz*, Prodr. Veg. Ind. Occ. (1788) 8, 120.
9. Ponthieva *R. Brown* in Aiton, Hort. Kew. ed. 2, 5 (1813) 199.

VI. Spiranthieae

10. Spiranthes *L. C. Richard*, Orch. Europ. (1817) 20, 28; in Mém. Mus. Par. 4 (1818) 42, 50.
11. Pelexia *Poiteau apud L. C. Richard*, Orch. Europ. (1817) 37, *nomen*; in Mém. Mus. Par. 4 (1818) 59, *nomen*–Sprengel, Gen. Pl. (1831) 658.
12. Sarcoglottis *Presl*, Rel. Haenk. 1 (1830) 95, t. 15.
13. Stenorrhynchus *L. C. Richard*, Orch. Europ. (1817) 37, *nomen*; in Mém. Mus. Par. 4 (1818) 59, *nomen*–Sprengel, Gen. Pl. (1831) 660.

VII. Physureae

14. Erythrodes *Blume*, Bijdr. Fl. Ned. Ind. (1825) 410; Tab. (1825) t. 72.

VIII. Pleurothallideae

15. Stelis *Swartz* in Schrad. Journ. 2 (1799) 239.
16. Physosiphon *Lindley* in Bot. Reg. 21 (1835) t. 1797.
17. Masdevallia *Ruiz & Pavon*, Fl. Peruv. et Chil. Prodr. (1794) 122, t. 27.
18. Lepanthes *Swartz* in Nov. Act. Ups. 6 (1799) 85.
19. Lepanthopsis *Ames* in Bot. Mus. Leafl. Harv. Univ. 1, no. 9 (1933) 3.
20. Pleurothallis *R. Brown* in Aiton, Hort. Kew. ed. 2, 5 (1813) 211.
21. Restrepia *Humboldt, Bonpland & Kunth*, Nov. Gen. et Sp. 1 (1816) 366 (Quarto ed.), 293 (Folio ed.), t. 94.
22. Octomeria *R. Brown* in Aiton, Hort. Kew. ed. 2, 5 (1813) 211.

IX. Liparideae

23. Malaxis *Solander apud Swartz*, Prodr. Veg. Ind. Occ. (1788) 8, 119.
24. Liparis *L. C. Richard*, Orch. Europ. (1817) 31, 38; in Mém. Mus. Par. 4 (1818) 43, 52.

X. Laelieae

25. Epidendrum *Linnaeus*, Syst. Nat. ed. 10 (1759) 1246 *pro parte*–ampl. Necker, Elem. 3 (1790) 133 *ex parte*.
26. Cattleya *Lindley*, Collect. Bot. (1824) tt. 33, 37.
27. Laelia *Lindley*, Gen. & Sp. Orch. Pl. (1831) 115.
28. Schomburgkia *Lindley*, Sert. Orch. (1838) tt. 10, 13.
29. Brassavola *R. Brown* in Aiton, Hort. Kew. ed. 2, 5 (1813) 216.

XI. Ponereae

30. Hartwegia *Lindley* in Bot. Reg. 23 (1837) sub t. 1970.
31. Scaphyglottis *Poeppig & Endlicher*, Nov. Gen. ac Sp. 1 (1835) 58.
32. Hexisea *Lindley* in Hook. Journ. Bot. 1 (1834) 7.
33. Ponera *Lindley*, Gen. & Sp. Orch. Pl. (1831) 113.
34. Isochilus *R. Brown* in Aiton, Hort. Kew. ed. 2, 5 (1813) 209.
35. Hexadesmia *Brongniart* in Ann. Sci. Nat. ser. 2, 17 (1842) 44.
36. Arpophyllum *La Llave & Lexarza*, Nov. Veg. Descr. 2

(1825) (Orch. Opusc.) 19.

37. Coelia *Lindley*, Gen. & Sp. Orch. Pl. (1830) 36.

XII. Polystachyeae

38. Polystachya *Hooker*, Exot. Fl. 2 (1824) t. 103.

39. Galeandra *Lindley* in Bauer, Illustr. Orch. Pl.–Gen. (1832) t. 8.

XIII. Corallorrhizeae

40. Corallorrhiza [*Haller*] *R. Brown* in Aiton, Hort. Kew. ed. 2, 5 (1813) 209.

XIV. Phajeae

41. Bletia *Ruiz & Pavon*, Fl. Peruv. et Chil. Prodr. (1794) 119, t. 26.

XV. Chysieae

42. Chysis *Lindley* in Bot. Reg. 23 (1837) t. 1937.

XVI. Bulbophylleae

43. Bulbophyllum *Thouars*, Hist. Pl. Orch. (1822) Tabl. des espèc. III & tt. 93-97.

XVII. Cyrtopodieae

44. Govenia *Lindley* in Loddiges, Bot. Cab. 18 (1831) t. 1709, *nomen*; Gen. & Sp. Orch. Pl. (1832) 153.

XVIII. Cataseteae

45. Mormodes *Lindley*, Nat. Syst. Bot. ed. 2 (1836) 446.

46. Catasetum *L. C. Richard apud Kunth*, Syn. Pl. Aequin. 1 (1822) 330.

47. Cycnoches *Lindley*, Gen. & Sp. Orch. Pl. (1832) 154.

XIX. Gongoreae

48. Lacaena *Lindley* in Bot. Reg. 29 (1843) Misc. p. 68.

49. Stanhopea *Frost apud Hooker* in Bot. Mag. 56 (1829) tt. 2948, 2949.

50. Gongora *Ruiz & Pavon*, Fl. Peruv. et Chil. Prodr. (1794) 117, t. 25.

51. Coryanthes *Hooker* in Bot. Mag. 58 (1831) t. 3102.

XX. Lycasteae

52. Xylobium *Lindley* in Bot. Reg. 11 (1825) sub t. 897.

53. Lycaste *Lindley* in Bot. Reg. 29 (1843) Misc. p. 14.

XXI. Huntleyeae

54. Warscewiczella *Reichenbach filius* in Bot. Zeit. 10 (1852) 635 (as Warczewiczella).

XXII. Maxillarieae

55. Maxillaria *Ruiz & Pavon*, Fl. Peruv. et Chil. Prodr. (1794) 116, t. 25.

56. Camaridium *Lindley* in Bot. Reg. 10 (1824) sub t. 844.
57. Ornithidium *Salisbury* in Trans. Hort. Soc. 1 (1812) 293, *nomen*–apud R. Brown in Aiton, Hort. Kew. ed. 2, 5 (1813) 210.
58. Mormolyce *Fenzl*, Nov. quaed. Gen. et Sp. Pl. (1849) 1; in Denkschr. Akad. Wissensch. Wien, Math.-Naturwiss. Cl. 1 (1850) 253 (both as Mormolyca).
59. Trigonidium *Lindley* in Bot. Reg. 23 (1837) t. 1923.

XXIII. Comparettieae

60. Ionopsis *Humboldt, Bonpland & Kunth*, Nov. Gen. et Sp. 1 (1816) 348 (Quarto ed.), 279 (Folio ed.), t. 83.
61. Scelochilus *Klotzsch* in Allg. Gartenz. 9 (1841) 261.
62. Comparettia *Poeppig & Endlicher*, Nov. Gen. ac Sp. 1 (1835) 42, t. 73.

XXIV. Trichopilieae

63. Trichopilia *Lindley*, Nat. Syst. Bot. ed. 2 (1836) 446.

XXV. Oncidieae

64. Osmoglossum *Schlechter* in Orchis 10 (1916) 162 (as subgenus); in Fedde Repert. Beihefte 17 (1922) 79.
65. Odontoglossum *Humboldt, Bonpland & Kunth*, Nov. Gen. & Sp. 1 (1816) 350 (Quarto ed.), 281 (Folio ed.), t. 85.
66. Brassia *R. Brown* in Aiton, Hort. Kew. ed. 2, 5 (1813) 215.
67. Miltonia *Lindley* in Bot. Reg. 23 (1837) sub t. 1976 & t. 1992.
68. Oncidium *Swartz* in K. Vet.-Akad. Nya Handl. Stockh. 21 (1800) 239.
69. Leochilus *Knowles & Westcott*, Floral Cab. 2 (1838) 143.

XXVI. Lockhartieae

70. Lockhartia *Hooker* in Bot. Mag. 54 (1827) t. 2715.

XXVII. Ornithocephaleae

71. Ornithocephalus *Hooker*, Exot. Fl. 2 (1824) t. 127.

XXVIII. Notylieae

72. Notylia *Lindley* in Bot. Reg. 11 (1825) t. 930.
73. Cryptarrhena *R. Brown* in Bot. Reg. 2 (1816) t. 153.
74. Macradenia *R. Brown* in Bot. Reg. 8 (1822) t. 612.

XXIX. Dichaeeae

75. Dichaea *Lindley*, Gen. & Sp. Orch. Pl. (1833) 208.

XXX. Sarcantheae

76. Campylocentrum *Benthum* in Journ. Linn. Soc. 18 (1881) 337.

Of the generic groups constituting the orchid flora of Middle America, the following have not as yet been found in Honduras: (1) Cypripedileae, (2) Cephalanthereae, (3) Tropidieae, (4) Zygopetaleae, (5) Trichocentreae, (6) Telipogoneae, (7) Pachyphylleae. The Cypripedileae are without representatives in the area formed by Guatemala, British Honduras, Salvador and Nicaragua. Of the three genera of the Cypripedileae represented in Middle America, Selenipedium is confined to Panama, Phragmopedium to Panama and Costa Rica and Cypripedium to Mexico. This peculiarity of distribution takes on added significance when it is borne in mind that with the exception of a single species in Trinidad, the Cypripedileae are without representatives in the West Indies. Only one species of the Cephalanthereae has been reported from Middle America. This is *Epipactis gigantea* Dougl., a species not known to occur south of Mexico. The Tropidieae, represented by two species, should occur in Honduras and will probably be found there as *Corymborchis flava* (Sw.) O. Ktze. is a native of Nicaragua, Salvador, British Honduras and Costa Rica and *Tropidia polystachya* (Sw.) Ames has been reported from Guatemala and Costa Rica. The Zygopetaleae are represented in Middle America by a single species, namely *Galeottia grandiflora* A. Rich. which is at present only known from Mexico and has been reported from Costa Rica. The Trichocentreae, represented by about ten species of Trichocentrum, have as yet been reported only from Mexico, Guatemala, Costa Rica and Panama. The Telipogoneae, represented in Middle America by approximately eight species, are not found north of Costa Rica. The Pachyphylleae, preponderantly South American, are at present known only from Middle America through *Centropetalum costaricense* A. & S. and *Pachyphyllum muscoides* (Kränzl.) Schltr., natives of Costa Rica.

Of the genera constituting the orchid flora of Honduras none is endemic and, with the exception of Wullschlaegelia, Lepanthopsis, Octomeria, Hexisea and Warscewiczella, all of them are found in Guatemala.

Of the species constituting the flora of Honduras the following are endemic:

1. Sobralia Edwardsii *Ames* in Bot. Mus. Leafl. Harv. Univ. 1, no. 10 (1933) 1.
2. Pelexia callosa *Ames* in Sched. Orch. 7 (1924) 15.
3. Pelexia hondurensis *Ames* in Sched. Orch. 2 (1923) 4.
4. Lepanthes Edwardsii *Ames* in Bot. Mus. Leafl. Harv. Univ. 1, no. 4 (1933) 4.
5. Lepanthes hondurensis *Ames* in Proc. Biol. Soc. Wash. 44 (1931) 43.
6. Pleurothallis hondurensis *Ames* in Sched. Orch. 7 (1924) 20.
7. Pleurothallis oscitans *Ames* in Bot. Mus. Leafl. Harv. Univ. 2 (1934) 25.
8. Octomeria hondurensis *Ames* in Bot. Mus. Leafl. Harv. Univ. 1, no. 4 (1933) 1.
9. Epidendrum comayaguense *Ames* in Bot. Mus. Leafl. Harv. Univ. 1, no. 8 (1933) 1.
10. Epidendrum Edwardsii *Ames* in Bot. Mus. Leafl. Harv. Univ. 1, no. 2 (1933) 1.
11. Epidendrum hondurense *Ames* in Bot. Mus. Leafl. Harv. Univ. 1, no. 7 (1933) 1.
12. Hexadesmia hondurensis *Ames* in Bot. Mus. Leafl. Harv. Univ. 1, no. 6 (1933) 1.
13. Bletia Edwardsii *Ames* in Proc. Biol. Soc. Wash. 45 (1932) 1.
14. Bletia papillifera *Ames* in Bot. Mus. Leafl. Harv. Univ. 1, no. 6 (1933) 5.
15. Oncidium hondurense *Ames* in Bot. Mus. Leafl. Harv. Univ. 1, no. 5 (1933) 1.

16. Campylocentrum hondurense *Ames* in Sched. Orch. 5 (1923) 37.

Two species collected by Gustav Niederlein near Tegucigalpa were believed by Rudolf Schlechter to be endemic: namely *Spiranthes hondurensis* Schltr. in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 378 and *Pleurothallis Niederleinii* Schltr. in Beihefte Bot. Centralbl. 36, Abt. 2 (1918) 396. *Spiranthes hondurensis* is referable to synonymy under **Sarcoglottis Thelymitra** (*Reichb.f.*) *Ames, comb. nov.* (*Spiranthes Thelymitra* Reichenbach filius, Beitr. Orch. Centr.-Am. (1866) 66), a species formerly believed to be confined to Costa Rica and Salvador. *Pleurothallis Niederleinii* is inseparable from *Pleurothallis longissima* Lindl., a species which is widespread in Middle America and occurs in the West Indies.

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STUDIES IN STELIS. II.

BY

OAKES AMES

AMONG the genera of the Pleurothallidinae the genus Stelis has been considered a very natural one, characterized by unmistakable peculiarities in the structure of the gynostemium and by a clearly diagnostic perianth. But in the group discussed in the preceding paper of this series the stigmas, as already stated, exhibit a conspicuous departure from the typical condition and represent a transitional trend toward Pleurothallis. Indeed, the type species of Pleurothallis, namely *P. ruscifolia* (Jacq.) R. Br., has a gynostemium that bears some resemblance to the gynostemium of *Stelis rubens*, differing chiefly from it in being obliquely truncate and unlobed, but resembling it in having the stigmatic orifice extending along the summit on the anterior edge. This peculiarity is very strongly marked in a Costa Rican species of Stelis that has not yet been described and which may be characterized as follows:

Stelis pendulispica *Ames, sp. nov.*

Herba verisimiliter caespitosa. Caules secundarii elongati, erecti, monophylli, vaginis amplis vestiti. Folium oblongo-ellipticum, valde coriaceum, usque ad basin attenuatum, in petiolum sulcatum elongatum contractum. Pedunculus plus minusve erectus, cum racemo folium excedens. Racemus elongatus, multiflorus, pendu-

lus. Flores valde congesti, purpurei. Sepala lateralia orbiculari-ovata, trinervia, intus valde glandulosa. Sepalum dorsale simile. Petala flabellata, apice valde incrassata, truncata, uninervia. Labellum carnosum, late unguiculatum, supra unguem late ovato-cordatum vel orbiculari-cordatum. Unguis labelli quadratus, callo elongato instructus. Columna abbreviata, apoda, apice trilobata.

Secondary stems probably densely caespitose, about 3 cm. long, erect, monophyllous, concealed by elongated tubular sheaths. Sheaths three to four, up to 2 cm. long, dilated upwards, the uppermost one much the longest, obliquely truncate. Leaf including the petiole 6.5 12 cm. long, 1.2 -1.7 cm. wide, oblong-elliptic or oblanceolate, rounded at the tridenticulate tip, coriaceous; petiole about 1.5 cm. long, sulcate, rigid. Pedumcle erect, 6 10 cm. long including the raceme, with five or six infundibuliform bracts, the lowermost one tubular and ample. Raceme 3 6 cm. long, pendulous or strongly arcuate, densely many-flowered. Flowers in several ranks, dark purple, subtended by broadly infundibuliform bracts which are almost contiguous along the rachis. Sepals equal, about 2 mm. long, 2 mm. wide, orbicular, densely glandular on the inner surface, 3-nerved, strongly convex, forming at base a shallow tube. Petals 1 mm. long, 1 mm. wide at the truncate thickened apex, cuneate or flabellate, 1-nerved. Labellum very fleshy-thickened, 1 mm. long, broadly unguiculate, broadly ovate-cordate or orbicular-cordate beyond the claw. Claw about 1 mm. wide, with a distinct broad callus in the middle. Column 3-lobed at the summit, with the stigmas confluent and extending to the lateral lobes forming a prominent pulvinate mass beneath the triangular rostellum.

Stelis pendulispica is readily distinguished from its allies by means of the pendulous racemes of crowded

flowers in several ranks. It is a very distinct species with no close affinities in Middle America, although the structure of the labellum suggests *S. ciliaris* Lindl. The flowers of Lankester no. 1175 are larger than the type, the sepals being about 1 mm. longer and smooth. Structurally the plant is inseparable from Alfaro's no. 141. I think it is probable that glandulousness in this case is of little consequence because the glandular emergences are readily rubbed off, and very often smooth and glandular sepals are characteristic of flowers which are beyond doubt referable to the same species.

Costa Rica, El Salvaje, Candelaria. Flowers chocolate, in four ranks. At 1,700 meters altitude. August 3, 1925. *Anastasio Alfaro 141.* (Type in Herb. Ames No. 30989.) (Under this same number, two other collections have been distributed. The plants are conspecific with those from El Salvaje. The data accompanying them are as follows: Estrella Valley. Flowers prune-purple. At 50 meters altitude. November 23, 1925. *Alfaro 141*; Estrella Valley, "Pandora." Flowers pansy-purple. At 50 meters altitude. September 12, 1925. *Alfaro 141.*); Satanillas de Acosta. Leaves up to 3¾ inches long, succulent. Sepals Corinthian purple (Ridgway xxxviii), petals and lip glistening as though wet with dew. Anthers nearly white, tinged with purple. At 5,000 feet altitude. August 1927 (flowered under cultivation at Cartago, October 27, 1927). *C. H. Lankester 1175.*

In 1925, I received from C. H. Lankester a Costa Rican species of Stelis which appears never to have been described. It is without close allies, although the structure of the labellum indicates relationship with *S. purpurascens* A. Rich. & Gal. The inflorescence is remarkable because the flowers do not conform to a fixed plan in their arrangement on the rachis. Some of the flowers are transversely attached. This peculiarity of the inflorescence is clearly shown in the accompanying illustration. For this species the name *Stelis transversalis* is proposed.

EXPLANATION OF ILLUSTRATION

STELIS PENDULISPICA *Ames.* Plant natural size. 1, flower much enlarged. 2, petals, labellum and column; labellum sharply deflexed; column (anther removed) showing the triangular rostellum overhanging the pulvinate stigmas. 3, labellum. 4, petal.

Drawn by Blanche Ames

STELIS *pendulispica* *Ames*

Stelis transversalis *Ames, sp. nov.*

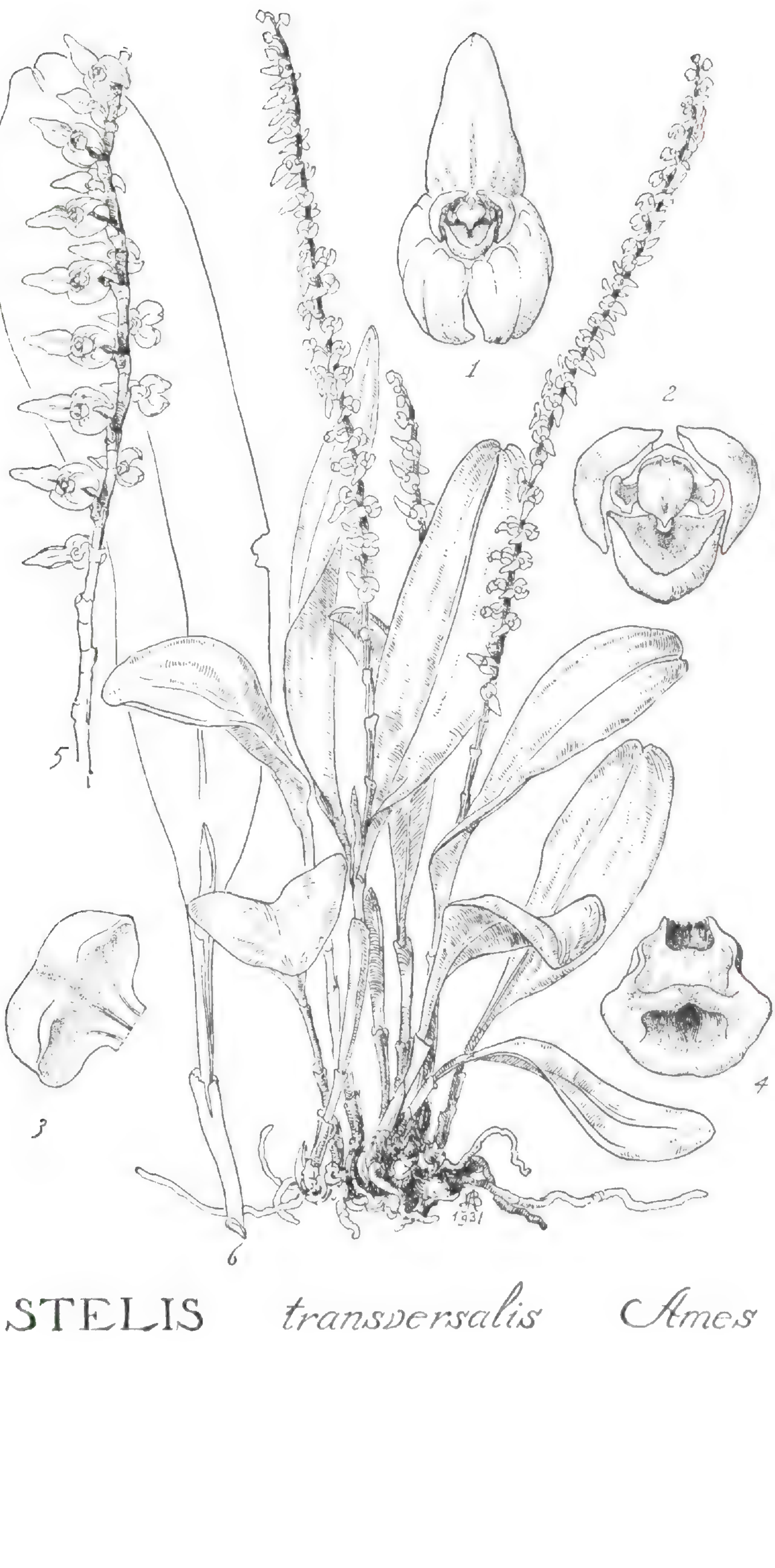
Herba valida, dense caespitosa. Radices fibratae. Caules secundarii monophylli, elongati, vaginis laxis instructi. Folium oblongo-ellipticum, in apice rotundatum, breviter petiolatum. Inflorescentiae singulae vel binae, terminales ad basin folii, subdensiflorae; pedunculus cum racemo folium permulto excedens, infra racemum paucibracteatus. Racemus elongatus, multiflorus, floribus partim transversalibus carnosis flavidis. Bracteae inflorescentiae approximatae, infundibuliformes. Sepala lateralia valde concava, anguste et inaequaliter ovata, usque ad medium connata, acuta, apice recurvata. Sepalum dorsale sepalis lateralibus longius, anguste ovatum, obtusum. Petala flabellata, valde carnosa, supra medium conspicue incrassata, trinervia. Labellum valde carnosum, rhombicum, antice excavatum, apice rotundatum, callo transverso ornatum. Columna carnosa, antice utrinque lobo carnoso stigmatifero instructa.

Secondary stems densely caespitose, erect, monophyllous, 3.5–6.5 cm. long, almost entirely concealed by two or three elongated loosely appressed tubular sheaths which are up to 3.5 cm. long. Leaf 6–12 cm. long, 2.1–3 cm. wide, rounded at the tip, elliptic-oblong, coriaceous, narrowed below into a short sulcate petiole. Peduncles one or two, arising from the axil of the leaf, including the slender elongated raceme up to 27 cm. long, emerging from a short conduplicate scarious sheath. Raceme usually about 12 cm. long, rarely exceeding 20 cm. in length, loosely many-flowered. Floral bracts very shortly infundibuliform, scarious, 1.3–3 mm. long. Flowers greenish yellow, more or less transversely inserted on the stiff rachis, 7–8.5 mm. from the tip of the dorsal sepal to the tip of either lateral sepal. Lateral sepals connate to about the middle, 2.9–3.6 mm. long, approximately 2 mm. wide, asymmetrically ovate, with the acute tips strongly re-

EXPLANATION OF ILLUSTRATION

STELIS TRANSVERSALIS *Ames*. Plant drawn about one fourth less than natural size. 1, flower much enlarged. 2, petals, labellum and column in natural position. 3, petal. 4, labellum showing transverse callus. 5, part of the raceme enlarged, showing the transversely arranged flowers. 6, leaf drawn natural size.

Drawn by Blanche Ames



STELIS *transversalis* *Ames*

flexed, strongly convex, 3–nerved with a conspicuous supplementary lateral nerve. Dorsal sepal 3.5–4.8 mm. long, about 3 mm. wide near the base, narrowly ovate, obtuse, convex with the margin strongly reflexed. Petals about 1 mm. long, 1.5 mm. wide, shortly unguiculate, flabellate or transversely elliptical, very fleshy, conspicuously thickened above the middle, 3-nerved. Labellum 1 mm. long, 1 mm. wide, fleshy, shortly unguiculate, rhombic in outline, with a transverse callus near the middle, rounded at the apex, with the anterior half concave. Column fleshy, with a stigmatiferous lobe on each side at the summit.

Costa Rica, Peralta. A hot country form. Flowers greenish yellow. May 1925. *C. H. Lankester 1007*. (Type in Herb. Ames No. 30993.)

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, JUNE 30, 1934 VOL. 2, NO. 7

A NEW LIPARIS FROM GUATEMALA

BY

OAKES AMES AND CHARLES SCHWEINFURTH

Liparis fantastica *Ames & Schweinfurth, sp. nov.* Herba terrestris, humilis. Caulis supra medium unifoliatus. Folium suborbiculari-cordatum, acutum. Inflorescentia brevis, crassa, grandiflora. Perianthii partes late patentes. Sepala lateralia lanceolata, acuminata, obliqua, reflexa. Sepalum dorsale persimile. Petala valde reflexa, filiformia. Labellum singulare, in circuitu lanceolatum, valde acuminatum, basi utrinque breviter lobatum, deinde sagittato-cornutum, prope medium dilatatum lateribus laciniatis involutis. Columna generis.

Plant terrestrial, up to 18.3 cm. tall. Roots fibrous, lanuginose. Stem decumbent at the slightly swollen base, provided near the base with two loose membranaceous sheaths of which the upper is elongate, bearing near its apex a single leaf, striate-angulate in the dried specimen. Leaf suborbicular-cordate, 4–6.5 cm. long to the sharp sinus, 4.2–6.4 cm. wide, abruptly acute, membranaceous, widely spreading, the mid-nerve carinate beneath. Peduncle below the inflorescence up to 3.8 cm. long. Raceme sublax, about 21-flowered or less, 2–3.9 cm. across in the dried specimen; rachis 1.4–3.8 cm. long; floral bracts minute, triangular, acuminate, concave, spreading. Pedicellate ovary slender, up to 11 mm. long. Flowers large for the plant, deep maroon. Lateral sepals reflexed

and parallel to each other, lanceolate, acuminate, 8.5- 10.8 mm. long, about 2 3 mm. wide, asymmetrical below, with revolute margins, 3-nerved with the mid-nerve more or less prominent beneath. Dorsal sepal very similar. Petals strongly reflexed in natural position, filiform from a triangular base, about 8 9 mm. long, 1-nerved. Lip lanceolate in outline, 7.5 9.3 mm. long, about 3.2 mm. wide near the middle when expanded, with a pair of erect semicircular more or less undulate lobules at the base; just in front are two fleshy retrorse horns; the central part of the disc is abruptly broadened and irregularly laciniate with inrolled sides; the apex is long-acuminate, the margins below the middle with short irregular teeth; the disc is fleshy-thickened between the erect basal lobules and is further provided with a linear fleshy callus extending about to the middle. Column characteristic of the genus, arcuate, 2.5 3 mm. long in natural position, dilated at the base, rather broadly winged above.

This is a most unusual Liparis with apparently no allies in the American tropics. In the peculiar structure of the flower, it recalls the otherwise dissimilar *Liparis angustiflora* J. J. Sm., a native of Java.

Guatemala, Department of Chimaltenango, Santa Elena. Terrestrial on moss-covered ground beneath young cypress trees, rooted very shallowly among decaying litter. At 9,700 feet altitude. Flowers deep maroon, column green. July 18, 1933. *Alexander F. Skutch 448* (Type in Herb. Ames No. 39544. Duplicate type in U.S. Nat. Herb. No. 1585824.)

Illustration: Plant natural size, drawn from the type. 1, flower much enlarged. 2, labellum spread out showing the basal and central callus-like thickenings and irregularly laciniate margin. 3, flower much enlarged, side view, showing the lobules, retrorse horns and the irregularly laciniate inrolled margin.

Drawn from dried specimens by Blanche Ames

LIPARIS *fantastica*

Ames & Schweinf.

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, JULY 11, 1934 VOL. 2, NO. 8

AN ADDITION TO THE GENUS VANILLA

BY

OAKES AMES

Vanilla insignis *Ames, sp. nov.*

Caules valde elongati, foliosi; foliis planis, coriaceis, oblongo-ellipticis, acuminatis, basi subrotundatis in petiolum abbreviatum angustatis. Sepala lateralia oblongo-lanceolata. Sepalum dorsale simile. Petala anguste lanceolata, extus per medium leviter carinata. Labellum fere usque ad medium columnae adnatum, leviter trilobatum, intus prope apicem valde et dense appendiculatum, intus infra medium dense et breviter glandulosum; lobis lateralibus irregulariter fimbriatis; lobo medio rotundato, obtuso, prope basim utrinque paucifimbriato. Discus labelli infra lobum medium plus minusve verrucosus, crista penicillata retrorsa. Columna gracilis, antice dense glandulosa.

Stems scandent, elongated, flexuose, about 6 mm. in diameter in dried specimens, many-leaved, giving the appearance of *Vanilla fragrans*. Leaves alternate, 11.5–15 cm. long, up to 4 cm. wide, 10–14 cm. apart, coriaceous, oblong-elliptic, abruptly acuminate at the tip, rounded at the base and abruptly contracted into the short petioles. Racemes axillary; rachis 3–4 cm. long, bearing approximately eight flowers. Bracts of the raceme about 7 mm. long, 5 mm. wide, broadly ovate, acute, fleshy, strongly concave, about 5 mm. apart. Pedicels abbreviated, nearly obsolete. Ovary at anthesis 3.5–4.5 cm. long, slender,

cylindrical, about 5 mm. in diameter in living specimens. Perianth segments porrect, hardly spreading. Lateral sepals greenish, 6.9–7.5 cm. long, 11–14 mm. wide near the middle, 6 mm. wide at the base, oblong-lanceolate, lightly cucullate at the pointed apex, fleshy. Dorsal sepal similar. Petals 7 cm. long, 9 mm. wide, narrowly lanceolate, acute, with the mid-rib prominent on the outer surface. Labellum 6.5–7 cm. long, adnate for about one half of its length to the column, forming with the basal half of the column a slender tube which is strongly inflated above, the free part lightly 3-lobed and 3–3.5 cm. wide; lateral lobes 1.5 cm. long, 1.5 cm. wide, coarsely lacerate-fringed with the segments of the fringe attaining a length of 5 mm.; mid-lobe 1.5 cm. long, 1.4 cm. wide, semi-orbicular, with a small half-round callus near the tip, the basal margin on each side paucifimbriate, the upper surface densely covered with retrorse complanate elongated appendages, the longest ones about 5 mm. in length, in the throat of the labellum these appendages become very much reduced diminishing to verruciform emergences on the nerves in front of the penicillate crest that is situated opposite the stigmas; the slender portion of the throat is densely covered almost to the base with erect or spreading glandular hairs. Column about 5 cm. long, weakly sigmoid, slender, densely glandular-hairy on the anterior surface; anther, pollinia and stigmatic portions as in *Vanilla fragrans*.

Republic of Honduras, Department of Comayagua, Esquias, El Rio Funes. Epiphyte in open river-valley forest at 2,500 feet altitude. Sepals and petals green, lip white, fringed; tip with a small green spot. Column yellow at the tip fading to white at the base. April 27, 1933. *J. B. Edwards 407* (Type in Herb. Ames No. 40085.)

Illustration: Plant natural size. Labellum natural size, spread out to show glandular throat and penicillate crest.

Drawn June 1934 by Blanche Ames

VANILLA
insignis
Ames
1934

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, JULY 31, 1934 VOL. 2, NO. 9

EPIDENDRUM CYSTOSUM, A NEW SPECIES FROM THE REPUBLIC OF HONDURAS

BY

OAKES AMES

THE FOLLOWING DESCRIPTION of *Epidendrum cystosum*, a new species of the genus Epidendrum, was prepared from specimens collected by James B. Edwards in the Republic of Honduras.

Epidendrum cystosum is a remarkable species without close allies. It is distantly related to *E. physodes* Reichb.f., a native of Costa Rica. From *E. physodes* it differs vegetatively in its obliquely ascending, chartaceous leaves, shorter stems and in the form of the labellum. It resembles *E. physodes* in having a vesicular pouch adnate to the summit of the ovary at the base of the labellum and in having the flowers succedent, usually a single flower being open at one time. The vesicular pouch indicates relationship with *E. prostratum* (Lindl.) Cogn., (*Physinga prostrata* Lindl.), from British Guiana, a species regarding which little is known and whose generic status, notwithstanding Cogniaux's conclusions, is still in doubt. *E. cystosum* differs conspicuously from *E. prostratum* in having the sepals almost entirely free at the base, not united to form a cup "as in Masdevallia," and in having a dissimilar labellum, a simple gynostemium and a vesicular pouch which is completely adnate to the ovary.

Recently Dr. R. Mansfeld (in Fedde Repert. 28 (1930)94) identified a species from Nanchital in the State of Vera Cruz, Mexico, as being referable to *Epidendrum prostratum* (Lindl.) Cogn., thus bringing this doubtful species into the flora of Middle America, but from the specimen I have examined, the Mexican plant appears to be referable to *E. physodes* and is in the same alliance with *E. cystosum*. From Lindley's analysis of his *Physinga prostrata* it is very evident that the structure of the labellum and its vesicular pouch differ markedly from what obtains in *Epidendrum physodes* and in the Mexican species associated with *Physinga prostrata* by Dr. Mansfeld.

Unfortunately only two specimens of *Epidendrum cystosum* (excluding an inflorescence in alcohol), have been available for study. Each specimen consists of a single leafy stem terminated by an elongated, pedunculate inflorescence. From these specimens it is not at all clear that the stems were densely caespitose, but an adhering fragment found at the base of one of the stems indicates that a densely caespitose habit may be typical of this species.

In the accompanying illustration the single stem represented may have been taken from a tuft of stems separated by the collector to facilitate the preparation of dried specimens. The drawings of the flower and the details of the expanded portion of the labellum were made with the aid of an inflorescence preserved in alcohol and show that the labellum in a fresh state is conspicuously thickened along the nerves.

Epidendrum cystosum *Ames, sp. nov.*

Herba epiphytica, verisimiliter caespitosa, humilis, gracilis. Radices fibratae, elongatae, carnosae, glabrae, patentes. Caules erecti, complanati, paucifoliati, vaginis

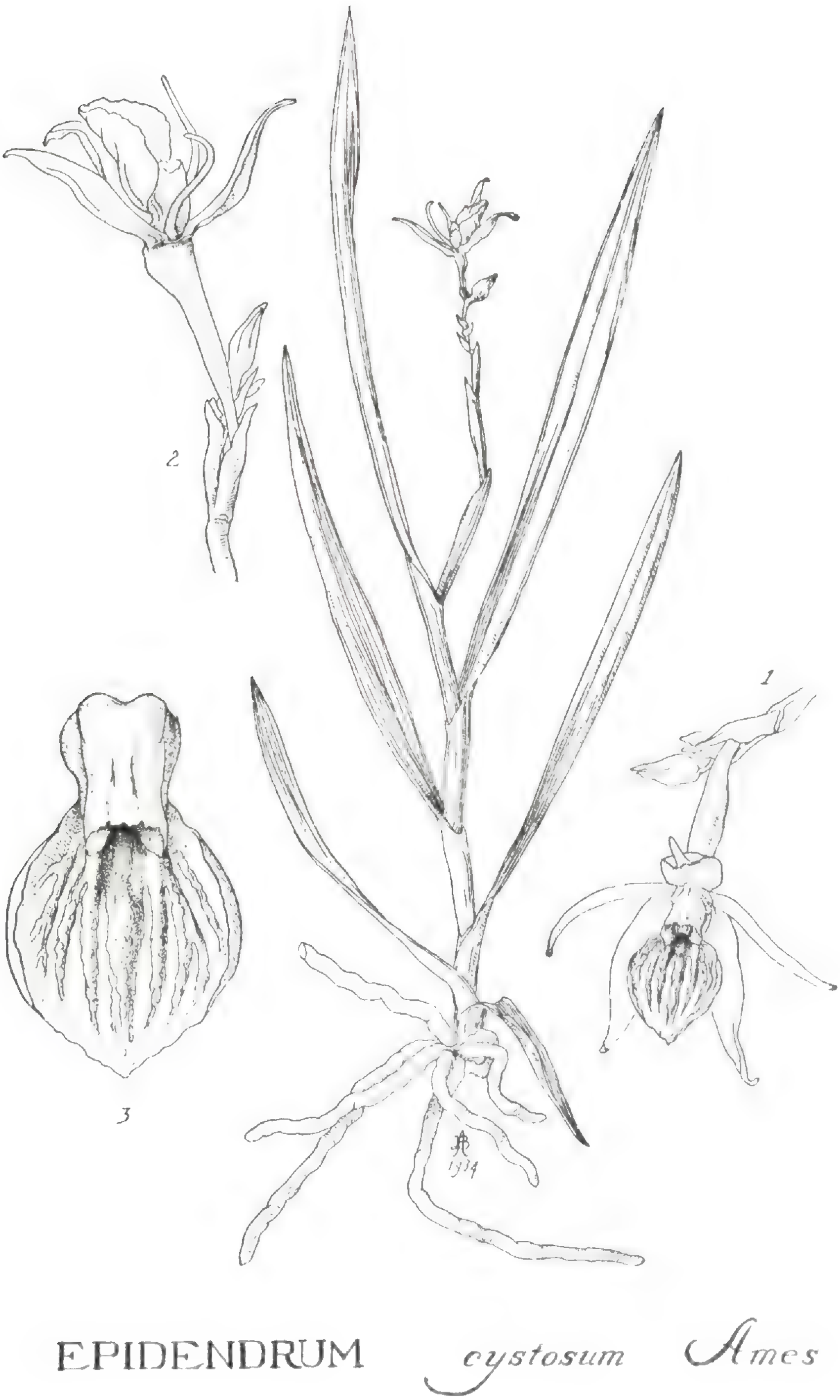
foliorum obtecti. Folia in sicco chartacea, disticha, oblique adscendentia, anguste oblonga vel lineari-lanceolata, utrinque angustata, apice acuta. Vaginae foliorum complanatae, elongatae, persistentes. Pedunculus valde elongatus, pauciflorus floribus succedaneis, paucivaginatus vaginis plus minusve imbricatis et complanatis et distichis. Bracteae inflorescentiae infundibuliformes, confertae. Sepala lateralia patentia vel oblique porrecta, lanceolata, usque ad apicem attenuata, trinervia, acuta, extus per medium carinata. Sepalum dorsale simile, trinervium. Petala patentia, linearia, usque ad apicem attenuata, acuta, uninervia. Labellum simplex, valde incrassatum, leviter deflexum, columnae valde adnatum, in laminam suborbicularem leviter concavam expansum, apice acutum. Discus costis valde incrassatis ornatus, nervo medio supra medium valde incrassato. Columna usque ad apicem vix dilatata, simplex. Ovarium elongatum sacco vesiciformi apice instructum.

Epiphytic herb about 13 cm. tall. Roots coarsely fibrous, smooth, longitudinally sulcate, whitish, spreading. Stems probably caespitose, erect, 4.5–5.5 cm. long, bearing about six leaves, complanate. Leaves 4.5–8 cm. long, 3.5–6 mm. wide, obliquely ascending, the uppermost one exceeding the tip of the raceme, chartaceous when dry, narrowly oblong or linear-lanceolate, tapering gradually to the acute tip, narrowed toward the base and jointed to tubular complanate sheaths which are about 15 mm. long and 2–3 mm. in greatest diameter. Peduncle terminal, to the tip of the rachis about 4.5 cm. long, few-flowered, usually one flower open at a time with the succeeding flower in bud. Peduncular sheaths about three, closely appressed, imbricating, complanate, acute, the tip of the uppermost one extending beyond the lowermost floral bract, the lowermost sheath about 2 cm. long. Rachis of the raceme 4–7 mm. long. Bracts of the ra-

EXPLANATION OF ILLUSTRATION

EPIDENDRUM CYSTOSUM *Ames*. Plant natural size drawn from the type. 1, upper part of the inflorescence showing the expanded flower and a bud. 2, side view of the expanded flower showing the vesicular pouch at the summit of the ovary. 3, labellum and adherent column drawn very much enlarged with the aid of the camera lucida. Figures 1–3 drawn from material preserved in alcohol.

Drawn July 1934 by Blanche Ames



EPIDENDRUM *cystosum* *Ames*

ceme infundibuliform, about 2.5 mm. long, acute, crowded. Lateral sepals lanceolate, 9 mm. long, 3 mm. wide, obliquely porrect, very slightly coherent at the base, acuminate, acute, somewhat conduplicate at the apex, 3-nerved with the mid-nerve carinate on the outer surface. Dorsal sepal similar, 3-nerved, reflexed, at the base lightly coherent with the lateral sepals. Petals linear, 8.5 mm. long, spreading, tapering gradually to an acute tip, 1-nerved. Labellum about 8 mm. long, adnate below the middle to the column, free portion 5 mm. long, 5 mm. wide, elliptical or suborbicular, acute, very fleshy, rigid, somewhat deflexed, lightly concave with a conspicuous elongated callus extending along the mid-nerve which is very prominent from the middle almost to the apex, this callus being joined on each side by an elongated, much thickened simple or branching costa and with a free intramarginal costa, (simple or branched) on each side extending from the base of the free portion almost to the apex. Column 3.5 mm. long, completely adnate to the labellum, minutely denticulate on the margin of the clinandrium. Pedicellate ovary 11 mm. long with a pouch-like swelling where the ovary joins the base of the labellum.

Department of Yoro, Bajo Grande. Epiphyte in dense mountain-forest at 3000 feet altitude. Sepals and petals light lavender; labellum greenish-yellow with light lavender ticking on the margin; column greenish-white with light lavender ticking. March 14, 1934. *J. B. Edwards 675* (Type in Herb. Ames 40087.)

A NOMENCLATORIAL NOTE

BY

OAKES AMES

Epidendrum neoporpax *Ames, nom. nov.*

Epidendrum porpax Reichenbach filius in Flora 48 (1865) 278, not Reichenbach filius in Bonplandia 3 (1855) 220.

Epidendrum vestitum Ames in Sched. Orch. 4 (1923) 51, not *Epidendrum vestitum* Swartz, Prodr. (1788) 124 which is *Ornithidium vestitum* (Sw.) Reichenbach filius in Walp. Ann. Bot. 6 (1863) 491.

Through an oversight, H. G. Reichenbach described two species, one a native of Nicaragua the other a native of Cuba, under the name *Epidendrum Porpax*. The Cuban species was described about ten years later than the Nicaraguan one and has to be given a new name. In Schedulae Orchidiamae 4 (1923) 51, I proposed the new name *Epidendrum vestitum*, but as a result of recent changes in nomenclatorial rules this name is invalidated because of the *Epidendrum vestitum* of Swartz published in 1788, a species which is now referred to the genus Ornithidium.

Epidendrum neoporpax is an extraordinarily rare species which is only known from Cuba.

BOTANICAL MUSEUM LEAFLETS
HARVARD UNIVERSITY

CAMBRIDGE, MASSACHUSETTS, AUGUST 10, 1934 VOL. 2, NO. 10

LEO LESQUEREUX

BY

WILLIAM C. DARRAH

THE NAME OF AGASSIZ is, in a historical sense, associated with two others, Guyot and Lesquereux. These three men, natives of Switzerland, colleagues at the Academy of Neuchâtel, and confreres in observational science, emigrated to America upon the suppression of the Academy by the Geneva Revolutionary Council in 1848. Agassiz came first and at his urging came the others. Lesquereux landed in Boston in the latter part of the same year with his wife and five children. He was then more than forty years old, deaf, and unable to speak a single word of English.

Leo Lesquereux was born on November 18, 1806 in the village of Fleurier, Canton of Neuchâtel. His parents were Huguenot, and of moderate circumstances. His father was a manufacturer of watch springs. Young Lesquereux attended the village school and later attended college in Neuchâtel in preparation for the University. He earned his tuition by tutoring, since his father could afford only the cost of board. At the age of 19 he was ready for the University, but found he was unable to finance the expense of education in Germany. Consequently he accepted a professorship in French at Eisenach, Saxony. After a few years he became engaged to a young woman, and accepted a more remunerative call at La

Chaux de Fonds near his home. He soon married, but within three years became totally deaf. Lesquereux was unable to continue teaching, and in order to provide for his family, joined in partnership with his father. However, each Sunday he would dash off into the mountains to gather mosses for study with his inexpensive microscope.

At this time the government was interested in peat bogs as a potential source of cheap fuel for the poor, and offered a gold medal of twenty ducats for the best study on peat. Lesquereux entered into the competition and won the prize with his creditable memoir entitled *Recherches sur les Tourbieres du Jura.* Up to the time of his death this was the most authoritative work on European peat. This publication resulted in the closer association between Agassiz and Lesquereux and in the grant from the King of Prussia which enabled him to travel over western Europe wherever peat was known to occur. The change of government soon after altered circumstances, so that all those patronized by the former government were removed from their positions.

The reputation which Lesquereux quickly acquired as a bryologist was responsible for his successes in America. Although his first work in this country was for Professor Agassiz – working up the plants collected on the Lake Superior expedition – he was called to Columbus, Ohio in December 1848 by William S. Sullivant. Mr. Sullivant was a man of wealth who devoted his time to the study of mosses and who, by 1845, with the publication of the *Musci Alleghenicnsis*, was the foremost bryologist in America. He desired Lesquereux to collaborate with him and publish the enormous collections he had accumulated. For two years he hired Lesquereux full time,and thereafter generously paid him for part time employment. In 1856 they jointly published the *Musci*

Exsiccati Americana which underwent several editions, the last in 1865. Lesquereux also wrote practically the entire Latin text for Sullivant's *Icones Muscorum.*

Upon the sudden death of Sullivant, all his extensive collections and library were deposited in Harvard University, and at the urgent request of Professor Asa Gray, Lesquereux was invited by his old colleague, Professor Agassiz, to come to Harvard to complete the proposed *Manual of North American Mosses.* This he agreed to do serving a portion of each year. Lesquereux worked diligently but his sight began failing him so that by 1872 he was unable to do close work. Fortunately Professor Thomas P. James was engaged to complete the comparatively few remaining microscopic determinations, but his untimely death again delayed the work until 1884 when it was finally published as the *Manual of North American Mosses.* It is still a useful as well a classic memoir.

Should Lesquereux have accomplished little else he would have earned a lasting place in the history of American botany. Yet this was the lesser side of his scientific attainments. He has been titled the *Nestor of American Paleobotany.* It was Lesquereux who gave to the collection of fossil plants in the Botanical Museum a status unique in the whole world. It is the type American collection, the actual basis for the study of all American fossil floras. No other museum in the world can boast of possessing all the original and fundamental floras accumulated in the first thirty years of its country's paleobotanic research. Lesquereux published his first paper on fossil plants in 1854, (Journ. Bost. Soc. Nat. Hist. vol. 6) when he described as new, 110 species of Carboniferous plants mostly from the Anthracite Coal Fields of Pennsylvania. This was followed by a more extensive survey of the Coal Flora in 1858 in Professor H. D. Rogers'

voluminous *Geology of Pennsylvania*. Almost annually thereafter Lesquereux published notices, papers, or monographs on paleobotanical discoveries.

He was by no means limited or provincial in his interest, although his name is usually linked with the study of Coal Measures plants. As early as 1860 he published a report on Miocene plants from Brandon, Vermont, and soon after on an Eocene flora from Mississippi. These were followed by reports on Cretaceous and Tertiary floras from the Western Territories.

The reputation as a paleobotanist which Lesquereux quickly acquired was really phenomenal. Material from all parts of the country was sent to him for study. Professor Agassiz engaged Lesquereux from 1865 to 1871 to work up the collection of fossil plants, then kept in the Museum of Comparative Zoology. Although he continued to maintain his legal residence in Columbus, Lesquereux spent several months of each year with the collection, and borrowed new or unusual specimens for study at his private laboratory. He published or rather submitted his first reports on the collection in 1867, and again in 1868. Whereas the collection was at this time remarkably rich in European specimens from classic localities and correspondingly poor in American plants, Lesquereux donated his collection of types in 1868. Subsequently all materials passing through his hands were deposited in the Museum Collection.

Each major contribution to American paleobotany marked a major advance in the status of the collection. Beginning in 1879 there appeared his great *Coal Flora of Pennsylvania*. First the Atlas of plates, then volumes one and two (bound together) 1880, and finally volume three in 1884. Simultaneously he was publishing the Miocene flora of California, a Permian collection from Colorado, and a Cretaceous flora from Colorado. The

types of all of these, except those of the third volume of the *Coal Flora*, are in the Collections of the Botanical Museum. These few late types found their way with the Lacoe collection, to the National Museum.

It is scarcely believable that such a valuable collection could become "lost." Yet this is exactly what happened, in spite of the splendid care the collection has had at the hands of Dr. Robert Tracy Jackson and Dr. J. A. Cushman, and the splendid storage facilities made available through the generosity of Mr. Elliot C. Lee and Professor G. L. Goodale, then director of the Botanic Garden.

For more than fifty years the collection of Lesquereux types has been supposedly lost, strayed, stolen, or sent somehow to Europe. Perhaps for this belief Lesquereux himself is to blame. R. D. Lacoe of Pittston, Pennsylvania carried Lesquereux* in the latter's last years as a semi-pensioner. He paid him a generous sum for the few types still in his private cabinet and paid him a salary to identify the Lacoe collection, which subsequently was given to the National Museum. Any species not found in this collection were presumably lost. Apparently, Lesquereux failed to mention that he had transferred to the Harvard Museum all specimens he received in Columbus. That is how the famous Lakes collection came here as well as others of lesser size and importance.

Lesquereux as a describer of species, hundreds of them, made the pioneer taxonomic contributions to North American paleobotany. However his interests were broader than this, species are means to an end, and that end is the distribution and correlation of entire floras in geographic space and geologic time. In this sense he was a modern. He significantly recognized a host of cosmopoli-

*Communication from Dr. David White dated July 16, 1934.

tan northern hemisphere plants and pointed out the marked resemblance between European and American fossil floras. He recognized as such the process of speciation in space and time. Furthermore it was he who demonstrated that the Miocene floras of California are identical with those in Colorado and east of the Rocky Mountains, proving beyond doubt the recency of Rocky Mountain uplift. He demonstrated the differences as well as similarities between European and American floras and denied any former continental union between the two excepting northern land bridges. He used, with success, fossil plants as "horizon markers" to identify coal seams, even in such complicated strata as the Anthracite Coal Fields.

In 1868 the collection contained 2500 specimens belonging to some 500 species. By 1885, the time of final donations from Lesquereux, it had grown to 10,000 specimens of 2000 "varieties." This entire priceless assortment has passed through the hands of Lesquereux. Within the past fifty years by purchase and donation the collection has been trebled in specimens and doubled in species–truly a remarkable collection unequalled in America! Its value scientifically has in no manner diminished, but rather increased proportionately with the years. Since many of the fossil plants possessed cosmopolitan distributions, or at least are believed to have, it is necessary that each of Lesquereux's species be accurately known. The great majority of American fossil types published prior to 1890 are poorly described and inadequately figured – if figured at all. Consequently neither American paleobotanists nor their European colleagues know the true nature of these long-used specific names of reputed validity.

During the final period of his life, Lesquereux suffered from the loss of his faculties more and more. As a

result the work of the closing years of his career are of little lasting value. Until the end, he kept working and writing. Most of his manuscript, his editing, and his proof-reading was accomplished in near-blindness. He maintained a warm personal correspondence with his many scientific friends until his peaceful death at his home in Columbus, Ohio, October 25, 1889 at the age of 83. To one he wrote: "about publications of mine, you have more titles than I know of, for I have forgotten many and many are not worth much."

Lesquereux's pioneer work in American paleobotany will long be remembered, and in no less degree will his careful study of American mosses. Far more of a challenge is his untiring work of high order in the face of trying circumstances and pathetic loss of faculty at an age of greatest productivity.